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ABSTRACT

This final report discusses the outcomes of a project designed to investigate the effective implementation of technology hardware and software as an instructionally integrated component of educating elementary children with disabilities within the regular classroom setting. The project conducted a series of applied research studies to use as a foundation for a model to facilitate the integration of technology in the instructional routines of students with mild disabilities. This work led to three outcomes: (1) a description of technology integration as the process of using technology for establishing educational goals and using it as one support in the delivery of instruction where it is appropriately indicated; (2) the definition of three technology integration principles: computer-assisted instruction should correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum; the use of the microcomputer should be an integral aspect of organizing students for instruction; there should be consistent monitoring of students' progress during the use of technology; and (3) the development of an emerging Technology Integration Enhancement model to guide programmatic efforts of educational change related to technology. A set of appendices representing the cumulative products generated during the project is attached. (Contains 30 references.) (CR)

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ED 412 695

FINAL REPORT

for

Evaluation of the Integration of Technology for Instructing Handicapped Children - Elementary Level

Contract # 300-886-0125

September 30,1991

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Executive Summary

The purpose of this executive summary is to highlight the activities and results of the work conducted by a research team at The Johns Hopkins University under the federal contract #300-86-0125, the Integration of Technology for Instructing Handicapped Children (Elementary Level).

During Phase One of the project (10/1/86- 9/30/89), a series of applied research studies were conducted as a foundation for a model to facilitate the integration of technology in the instructional routines of students with mild disabilities. This work led to three outcomes: (a) a definition of technology integration as the process of using technology for established educational goals and using it as one support in the delivery of instruction where it is appropriately indicated; (b) three technology integration principles; and (c) an emerging Technology Integration Enhancement model to guide programmatic efforts of educational change related to technology. The three principles were based on Phase One research but also on the work of others. These principles are: (a) computer-assisted instruction should correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum, (b) the use of the microcomputer should be an integral aspect of organizing students for instruction, and (c) there should be consistent monitoring of student progress during the use of technology.

The TIE model is based on a conceptual framework which recognizes that four realms are involved in the process of educational change and that there must be on-going communication between individuals from all four realms. Administrative support, resource allocation, teacher development, and instructional delivery are essential supports for classroom level interventions. With these realms as a context, the primacy of teacher decision-making was recognized and regarded as a key factor to successful long-term technology integration.

The TIE model posits a dynamic approach to staff development and includes resource guides for teachers and administrators as well as materials for teacher trainers. The implementation and evaluation of the TIE model was based on the Concerns Based Adoption Model (CBAM) for planning and assessing educational innovations. Its premise is that change is a process and that teachers will successfully adopt appropriate technologies if their current concerns and use levels are recognized and respected. The Hopkins' project represented the first major systematic attempt to use CBAM to evaluate teachers' adoption of technology in special education.

Forty-six teachers from four school systems (counties) participated in the staff development activities premised on the TIE model. Project staff presented training modules related to Curriculum Correspondence, Instructional Organization, and Monitoring Progress during 75 minute sessions. In addition to the modules, TIE training materials include a Teachers' Technology Resource Guide and a Principal's Assistant. Technical assistance and individual consultations were provided between and after the formal sessions. Individual session evaluations were uniformly satisfactory.

The three diagnostic dimensions of the CBAM model are Stages of Concern, Levels of Use, and Innovation Configuration. Although there was individual variation, the teachers as a whole reflected shifts toward higher stages of concern and levels of use as well as fuller implementation of the TIE model over Phase Two. The patterns of concern, reported use, and implementation mirrored those seen with successful adoptions of other innovations.

Introduction

This document represents the Final Report for the federal contract, Evaluation of the Integration of Technology for Instructing Handicapped Children. According to the U. S. Department of Education, Office of Special Education Programs (OSEP) the purpose of the project was "to investigate the effective implementation of technology hardware and software as an instructionally integrated component of educating handicapped children within the regular education setting" (OSEP, 1986, p. 2). The Johns Hopkins University team was awarded the contract to study the integration of technology at the elementary school level from October 1, 1986 to September 30, 1991.

The project consisted of two distinct phases. Phase I, representing the first three years of the project, consisted of a series of programmatic research studies designed to provide support for a model to effectively achieve technology-integrated instruction for students with mild handicaps. Phase II, representing the final two project years, provided an initial evaluation of the effectiveness of the technology integration model developed in Phase I.

There are three major sections of the final report. The first section is a narrative account which chronicles the history and contributions of the project as well as identifying the limitations of the effort. The second section is a set of Appendices, cumulatively representing the products (e.g. training manuals, resource materials etc.) generated during the project. The third section describes the plans for disseminating the project's model and findings.

A brief synopsis of Phase I studies is provided in Part One based on information previously presented to and available from OSEP. A discussion of the limitations and suggestions for future research based on Phase I findings is presented.

The Technology Integration Enhancement (TIE) model, derived in part from Phase I studies is also presented in Part One. A precis of the documents which support the implementation of this model is provided as well. The actual documents appear in Part Two of the Final Report.

Phase II represented an initial evaluation of the effectiveness of the model. An introduction to our approach for this phase, the methods, the results from the participating schools and teachers, and a discussion and interpretation of these results are provided in Part One of this report. Since this information is presented for the first time (except for monthly administrative reporting purposes), it is presented in its entirety.

Part Two consists of sets of materials which enable interested parties to replicate the Technology Integration Enhancement model. These materials are organized according to the major realms of the conceptual framework for technology integration. Potential users of these materials include, but are not limited to, teacher trainers, administrators, and computer coordinators.

Finally, Part Three consists of the Plans for Dissemination which enumerates accomplishments to date and also action plans for future consideration.

Phase I - Years 1-3: Building the Model's Foundation

Synopsis of Final Report for Phase I

Phase I of the federal contract, "The evaluation of the integration of technology for instructing handicapped students at the elementary level" began October 1, 1986 and continued through September 30, 1989. The purpose of Phase I was to develop an applications model which would facilitate the successful integration of educational technologies, specifically computer assisted instruction, in classrooms serving students with mild disabilities. Toward this end, two major and interrelated activities were completed. First, 16 applied research studies were conducted in 33 schools within six local education agencies (LEAS) in Maryland and Pennsylvania. These studies helped to identify factors relating to the successful integration of technology in instruction for students with mild disabilities and formed the foundation for the Technology Enhancement (TIE) Model. The major findings of these studies as they relate to the elements of instruction are presented in an appendix to the Final Report for Phase I.

These studies focused on (a) grouping arrangements, (b) teacher directions to bridge CAI and non-CAI activities, (c) teacher modification of CAI programs to achieve curriculum correspondence, (d) optimum time allotments for CAI programs, (e) purposes of computer use, (f) students' perceptions of computers, (g) teachers' CAI use decisions, (h) students' self-monitoring using CAI, (i) cooperative learning assignments, and (j) time vs. criterion based assignments.

Second, an extensive literature review was conducted to develop a conceptual framework and underlying principles for a technology integration model. This review was presented in Draft of the Model, Volume I and submitted as a deliverable to the Office of Special Education Programs (OSEP) at the end of Phase I. This review illustrates how technology integration principles evolve from and further the goals of the effective schools movement and mainstreaming. Thus, technology integration was viewed as a process embedded within larger structures and issues.

The Concerns Based Adoption Model (CBAM) was selected as the evaluation process for the application of the Technology Integration Enhancement (TIE) Model. Developers of the CBAM model contend that change is a process and that different individuals adopt innovations within different time frames and in different ways. Although the CBAM model has been used for the past 15 years to describe and evaluate other types of educational innovations, our project represents the first large-scale use of the CBAM model for technological innovations. The philosophy and practice of CBAM as it applies to technology training for teachers who serve students with mild handicaps was described in Draft of the Model, Volume II also submitted to OSEP at the end of Phase I.

Discussion

This section will identify the major limitations of Phase I studies and recommend courses of action for future research.

Limitations. The major limitations relate to start-up concerns and to difficulties gaining entry to selected schools. As might be expected, the time required to obtain permission from central administrations to conduct research in the district is often underestimated. This was true in our case. Districts who had recent experience with the faculty at Johns Hopkins University were more amenable to participating in the TIP project. In short, this suggests the need for on-going collaborative relationships with school districts whether or not a defined project is underway.

Another deterrent was the discrepancy between district and building level perspectives regarding resident technology (hardware). On several occasions, administrators would attest to the availability of equipment at the building level; however it was not available for instructional use to the classroom teacher. We also found that there was far less access to technology for students than district level personnel reported. As a generalization, the closer the person was to the classroom action, the more accurate were their reports of actual use. The impact of this discrepancy was time lost pursuing leads for schools which did not meet all of our criteria.

Another criteria, related to students with mild handicaps who were instructionally integrated was also difficult to meet. In one county in particular, most students with mild handicaps were not served in regular classes.

A final limitation relates to the evolving nature of technology. Many of the school systems were implementing new technological configurations (e.g. lab) which were not compatible with the focus of our project.

Although the Phase I studies yielded a number of very positive results, small sample sizes prevented the conclusions from being generalizable. With several of the studies there was the difficulty of stimulus equivalence (i.e. matching the software to the non-CAI method of instruction of vice versa).

Recommendations for future research. As a result of Phase I studies, a technology integration model was developed. The logical sequel to the model development phase was to evaluate the model across teachers and schools. This program evaluation effort was the primary focus of Phase II and consisted of measuring teachers' behaviors and attitudes before and after TIE training sessions.

Whereas the plan for Phase II was to evaluate the TIE model as a unit, studies examining selected features of the model would be instructive. For example, the job embedded format with training scheduled at school sites with follow-up technical assistance may have added to the value of the training and ultimately to the model's adoption.

As one designs future studies, we also would recommend examining the role of technology integration on student outcomes. Measures of student outcomes were sometimes but not always available in Phase I studies. For example, one study (Panyan, Hummel, Steeves, & Givner, 1989) illustrated the value of teacher bridging directions between non-CAI and CAI activities (i.e. drill and practice software in language arts) by noting the impact on the students' learning rate and percent correct.

Finally, a comprehensive set of recommendations is provided in the Discussion section of Phase II of this report.

The Technology Integration Enhancement (TIE) Model

Model Derivation and Definition

The primary research goal of the Johns Hopkins University's Technology Integration Project was to "empirically determine elements of a successful technology integration model." Initially, the proposed applications model was defined as a set of procedures for effectively implementing and managing CAI practices within mainstreamed classrooms and other educational settings. The conceptual framework for the model was designed to specify the important variables associated with the model's implementation and their interrelationships.

TIE conceptual framework

The need for well-educated teachers has long been recognized by educators (Carnegie Forum on Education and the Economy, 1986). Research has shown that students learn better from instruction which results from professional planning, thinking, and decision making by teachers (Clark & Peterson, 1986). Teachers are looking less for prescriptions and more for guiding principles which help them make decisions, and help them negotiate among complex and conflicting task demands (Alford, 1983; Porter & Good, 1988). Researchers and teachers must share the responsibility for the development and implementation of such guiding principles. The Johns Hopkins Technology Integration Project has worked to develop such principles. From the outset, the Hopkins' model of technology integration has focused primarily on classroom level elements of the integration of technology into the instruction of students with mild handicaps. The conceptual framework of TIE is based primarily on classroom-based studies.

The core ideas which contributed to the emergence of the project's conceptual framework are: (a) the elements of instruction and the factors which contribute to effective instruction; i.e., sound instructional practices; (b) the human processes of collaboration and support; and (c) the process of educational change. An appreciation for the process of change assists the development of a framework intended to guide practice.

Fundamental to the TIE conceptual framework is an understanding of the elements of instruction and sound instructional practices. While it was useful in the development of the project's framework to reference the results of the project's studies to the elements of instruction, related ideas were needed to complement this work. Just as technology needs to be integrated into non-computer instruction, technology ideas need to be integrated into ideas about instruction that may not yet reflect technology. Technology integration requires the assimilation of technology ideas into instruction ideas, and the assimilation of CAI into non-computer instruction.

Model Description

As can be seen in Figure 1, the TIE conceptual framework can be visually portrayed as a series of concentric circles with student outcomes at the center. This graphic indicates the importance of setting conditions and on-going support for effective technology integration. The TIE conceptual framework is based on a systems analysis perspective which recognizes that four realms are involved in the process of educational change and that there must be on-going communication between individuals from all four realms. Administrative functions, resource allocation, teacher development, and instructional delivery are essential realms critical to successful interventions at the classroom level which effect student outcomes. Although a brief description of each realm will follow, the Technology Integration Project has concentrated on classroom level activities in teacher development and instructional delivery realms.

Instructional Delivery: Effective schools are characterized as having systematic and consistent procedures for monitoring and assessing student progress. Teachers make educational decisions regarding what, when, and how to teach according to the demands of the curriculum and the characteristics of the students. These characteristics include current competency levels in each area of the curriculum as well as abilities and potential for progressing. Systematic and consistent monitoring of student progress is necessary to determine current levels of student performance and progress toward instructional goals. Instruction should be planned according to a series of objectives set forth in the curriculum. The criterion of adequate performance should be stated so that it can be determined that the objective was accomplished. In order for technology to be effective, it is important to adhere to basic procedures for utilizing instructional objectives as a criterion for determining adequate learning. Researchers and teachers must share the responsibility for the development and implementation of such guiding principles. Staff of The Johns Hopkins Technology Integration Project have developed such principles.

(1) The first principle focuses on the curriculum content of instructional goals. **Computer-assisted-instruction should correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum.** If we accept the premise that teachers of students with mild handicaps should know and should follow the mainstream curriculum objectives, and if we accept that technology should promote those objectives, then teachers should use software with corresponding content.

A number of considerations led to a principle which focuses on curriculum correspondence: a) the importance of teachers' knowledge of content; b) allocation of time to the content students are supposed to be learning; c) the importance of the mainstream curriculum for the instructional integration of students with handicaps; and d) the primacy of the content correspondence of software for selection and use decision.

(2) The second principle focuses on instructional organization. **The use of the microcomputer should be an integral aspect of organizing students for instruction.** If we understand that being integrated means being a natural and consistent part of the daily routine, a part that is not more differentiated nor distinguishable than other parts, then we understand that we want computer use to blend in, and be as automatic as any other activity structure.

Reviews relating to effective instruction for students with handicaps, the primacy of the Technology Integration Project studies of instruction in the project's original plan, and the wealth of insight derived from those studies pointed toward an element which focused on instructional organization.

(3) The third principle focuses on monitoring student progress. **There should be consistent monitoring of student progress during the use of technology.** If we recognize the importance of monitoring student progress and recognize the capability of technology to assist in collecting, recording, and reporting student progress, then for the integration of technology, technology supported monitoring strategies should be used.

The project's sustained concern for the needed balance between student's self-monitoring and teacher monitoring of students use of software, the saliency of monitoring progress in the effective instruction literature, and the potential of technology to support monitoring led to this principle.

Over the past five years the TIP staff has developed products to enable educators to integrate technology in instruction. These products will be briefly described in this section and included in their entirety in the Appendices. Each product relates to one aspect of the conceptual model and collectively represent the comprehensive set of materials for a school system to adopt the model.

Teacher Development: Despite the increased availability of computers in the schools, the anticipated benefits of the technology are not being realized. A report from the Office of Technology Assessment, U.S. Congress, (U.S. Congress, Office of Technology Assessment, 1988), finds that investments in technology cannot be fully effective unless teachers receive training and support. A major aspect of the current drive to improve American education is the focus on raising professional teaching standards and giving teachers greater responsibility and autonomy.

Technology could be an important lever for change, yet the vast majority of teachers, or those intending to teach, have had little or no training in the use of computers in the classroom. In-service training in technology has unique requirements that distinguish it from traditional in-service activities. Teachers need a well-equipped facility, an environment that allows them to explore the technology, and time to master the software which will enhance the skills of their students. In addition, instructors for these activities must appreciate teachers' special concerns, and must often overcome technology anxiety. If computer technology is to "have an impact on teaching and learning, teachers must be comfortable with computers, seeing them as tools that enhance, rather than interfere with, their daily teaching. For this to happen, teachers need special training" (U.S. Congress, Office of Technology Assessment, 1988 p. 98). The TIE model, based on principles of best practices in education, represents one approach to train teachers to integrate computer assisted instruction.

Resource Allocation: In addition to human resources , material resources are essential for any technology integration effort. The TIP research team members found that there is a baseline of resources which are necessary for accomplishing the integration of technology for instruction in the elementary school. It is recommended that a special education resource room should possess at least one permanently resident computer, whereas integration may be achieved in a regular education elementary school classroom which has access to .5 microcomputers daily. These computers should have at least 64 Kilobytes of memory.

Leadership: Administrative functions, both at the building level and at the district level, are essential for the integration of technology. Administrative functions refers to leadership and related goals, objectives, and strategies which empower teachers and learners. It includes actions which help create professional work environments, and which give tangible resources to classroom level activities, and to teachers and learners. Particular importance is attached to the planning process which includes the use of Strategic Concepts, Tactical Steps, and Implementation Procedures.

Supporting documents for the TIE Model

The **Instructional** component with its three elements and twelve essentials provides the needed clarity of task for teachers and all others involved. The three elements are: Curriculum Correspondence, Instructional Organization, and Monitoring Progress.

Format: The Instruction materials are modularized staff development manuals that are used to provide specific staff development sessions for teachers. These modularized manuals include: Instructor's Notes, Handouts and Transparencies.

Focus: These Instruction materials focus on how teachers can make technology an integral aspect of student's instruction. The twelve essentials for the integration of technology into instruction are each associated with one of the three elements of instruction. These elements are curriculum correspondence, instructional organization, and monitoring progress. Fundamental to the TIE conceptual framework is an understanding of the elements of sound instructional practices.

The research studies conducted by the Technology Integration Project team led to the development of the following guidelines which are clustered according to the three aforementioned principles.

The Twelve Essentials for the Integration of Technology into Instruction

Curriculum Correspondence

1. **Write lesson plans** naming specific software which matches student curriculum and skill objectives.

2. **Preview, select, and/or modify software** to meet student curriculum and skill objectives.

3. **Link computer activity** with regular instruction using examples and modeling.

4. **Group students** at the computer according to academic needs.

Instructional Organization

5. **Group students** according to social and classroom factors.

6. **Post/share schedule** including time, group, and software to be used.

7. **Provide clear directions** (verbal and visual) for using the program.

8. **Continuously monitor computer activities** and student behavior in the classroom.

Monitoring Progress

9. **Continuously monitor student progress** while using software.

10. **Record student progress** at each session.

11. **Use performance information** for future lesson planning.

12. **Instruct students to use features of software** to self-monitor performance.

The **Support** component includes strategies that facilitate and undergird the efforts of teachers to implement the twelve essentials. This support comes in the form of material and human resources. This component includes Facilitation Support Strategies and the Teachers' Technology Resource Guide.

a. Support Materials

Format: The Support materials are modularized staff development manuals that can be used to provide specific staff development sessions or serve as a tutorial. The materials are in a narrative format with masters. The masters can be used as handouts or transparencies and the narrative can be easily transformed into comments to guide the discussion of the handouts and transparencies.

Focus: The Support materials focus on how to help teachers actually incorporate the twelve essentials for the integration of technology into their repertoire. A review of the twelve essentials reveals that the demand on teachers is substantial. Teachers must receive support if they are going to successfully respond to this or any similar demand. Virtually every innovation or program development effort includes the provision of specific staff development sessions. However, typically much more is needed. Consulting and collaborative problem solving are particularly important.

b. The Teachers' Technology Resource Guide

Format: The Teachers' Technology Resource Guide is a directory of resources that is divided into twelve sections as follows: Magazines and Newsletters, Associations and Journals, Magazines for Families, Software Review Catalogues, Software Curriculum Guides, Sources of Public Domain Software, On-Line Information Services, Networking, User's Groups, Resource Centers, National Projects, and Funding Sources and Grants. Addresses and or descriptions are provided.

Focus: This guide supports teachers who are implementing TIE by providing brief descriptions of the above listed kinds of resources. Specific illustrations of the use of the guide are provided with the staff development sessions. Teachers and those in supportive roles are encouraged to contact these sources

In summary, the Twelve Facilitation Support Strategies of TIE are:

1. Adding and linking resources.
2. Helping teachers understand the possibilities.
3. Providing specific staff development sessions.
4. Consulting and collaborative problem solving.
5. Organizing the technology.
6. Giving solutions.
7. Providing technical assistance.
8. Providing models and demonstration.
9. Energizing and motivating.
10. Developing support structures.
11. Supporting the teacher emotionally.
12. Monitoring and evaluating.

The **Leadership** component focuses on three interrelated clusters that define the essentials of planning. These clusters are Strategic Concepts that must be reflected in the process of planning, Tactical Steps (or objectives) that further define the plan, and specific Implementation Procedures that describe activities. These clusters are highlighted in the Leadership Guide for Planning. A Staff Development Manual and the Principal's Assistant are two resources for this component.

a. Staff Development Manual.

Format: The staff development materials are in a narrative format with masters. The masters can be used as handouts or transparencies and the narrative can be easily transformed into comments to guide the discussion of the handouts and transparencies. In addition, there is a literature review that develops the rationale for the included approach to planning.

Focus: This manual focuses on three interrelated clusters that define the essentials of planning. These clusters are Strategic Concepts that must be reflected in the process of planning, Tactical Steps (or objectives) that further define the plan, and specific Implementation Procedures that describe activities. Examples from previous staff development sessions and activity templates are provided to guide the provision of sessions.

b. The Principal's Assistant

Format: Three Building Principal task areas (Communications Tasks, Instructional Tasks, and Management Tasks) are used to organize descriptions of software features and solutions. Specific tasks within these areas are listed with descriptions of application packages that can support those tasks. A comprehensive list of MS-DOS compatible products and lists of resource materials is also provided.

Focus: The Principal's Assistant is a guide for the building administrator who is working to use computers to support three essential administrative task areas. The listings of features and product descriptions help principals explore and utilize various application packages.

Phase II -Years 4-5: Initial Evaluation of the Model

According to The National Survey of Instructional Uses of Computers (Becker, 1987a), in 1987 more than ninety percent of students in the United States attended a school which had at least one computer. The numbers of computers have increased rapidly since then. More than fifty percent of all school aged children have some access to computers, yet the research shows that the use of computers in schools has made little impact on student achievement (Becker, 1987b). Together with other studies evaluating American education, the National Commission on Excellence in Education (1983) painted an alarming picture of the status of public school education in this country, mandating a movement toward educational reform which would lead to higher levels of achievement. These studies led to attempts to identify exemplary schools, to document effective teaching practices, and ultimately to describe some requisites for school improvement.

In 1986, the National Task Force on Educational Technology answered the charge by submitting a report entitled: Transforming American Education: Reducing the Risk to the Nation. This report to the Secretary of Education put forth the challenge that educators should recognize the importance of technology for meeting educational needs, and that decision-makers at all levels should establish goals which are commensurate with that importance. With the advent of PL 94-142 and the increased participation of students with handicapping conditions in regular classrooms the rationale for successful use of technology with non-handicapped students and the rationale for use with students with handicapping conditions are interrelated.

The National Task Force on Educational Technology's report also enumerated ways in which technology might address some of the difficulties currently facing American education. The Task Force recommended that "schools use technology-based education to make learning more active and interactive for each student, including pacing at a rate appropriate for each student. Schools should explore ways to modify classroom organization to capitalize on the opportunities presented by the technology" (p. 20). The integration of technology into instruction rather than the isolated applications of technology became recognized as the preferred course of action. The rationale for integrating technology into the instruction of students with handicaps (Behrmann, 1988) is compatible with the rationale for integrating technology into the instruction of non-handicapped students.

What is the empirical basis for the classroom use of computer-assisted-instruction (CAI)? In the mid 1980's, after twenty years of systematic investigations of the effectiveness of computer-delivered instruction, the jury was still out. Did instruction delivered by the computer improve student learning or not? Much of the empirical research cited in the early 80's

(Holland, 1980; Jamison, Fletcher, Suppes, & Atkinson, 1975; Suppes & Morningstar, 1969) used sophisticated CAI delivered on mainframes with little generalizability to stand-alone microcomputers and floppy-disk software. The federal government provided research grants and contracts to investigate effective applications of microcomputer technology in special education. Soon empirical evidence of the efficacy of using technology for instruction began to appear. The results were troubling. The evidence was not clearly in favor of the use of computers for instruction (Becker, 1987b; Roblyer, Castine, & King, 1988). Researchers began to analyze why results appeared equivocal. What has resulted from this close scrutiny has been a refinement of research methodology and a greater appreciation of what kinds of questions made sense to ask (Salomon & Gardner, 1986). Rather than investigate the comparative efficacy of teacher vs. computer-directed-instruction, investigations have begun which identify the specific contexts in which the use of computers for instruction makes a significant difference in variables related to learning effectiveness. Computer-assisted-instruction is no longer seen as replacing teachers, but as potential instructional tools which may assist teachers in their attempts to provide efficient, effective, and meaningful instruction to their students (Pea & Soloway, 1987). It is the integration of technology into the instruction of students that appears to hold the greatest promise.

Several articles have specifically addressed the integration of technology into the instruction of students with mild handicaps (Bransford, Sherwood, Kinzer, & Hasselbring, 1986; Hasselbring, 1987; Semmel & Lieber, 1986). The use of computers for instruction has to be analyzed in light of the entire instructional context. Semmel, Cosden, Semmel, and Kelemen (1984) state that the ultimate success or demise of microcomputer applications is dependent upon the degree to which the technology is appropriately used by personnel most proximal to its intended applications. Therefore, the focus of the work of the Technology Integration Project has been to develop a model which focuses on training teachers and identifying sources of support to sustain their efforts in complex and dynamic environments.

Research has shown that students learn better from instruction which results from professional planning, thinking, and decision making by teachers (Clark & Peterson, 1986). Teachers are looking less for prescriptions and more for guiding principles which help them make decisions, and help them negotiate among complex and conflicting task demands (Alford, 1983; Porter & Good, 1988). Researchers and teachers must share the responsibility for the development and implementation of such guiding principles. The TIE model reflects this process.

In Phase I (October, 1986 to September, 1989) the Technology Integration Project (TIP) staff conducted research, reviewed the research of others, and synthesized the results of its work and the work of others into the

Technology Integration Enhancement Model, TIE. The interrelated Phase I TIP studies are described in twelve technical reports. A summary of the project studies which relates those studies to aspects of instruction is provided in Appendix A.

The core ideas which contributed to the emergence of the TIE model are: (a) the elements of instruction and the factors which contribute to effective instruction, i. e. sound instructional practices; (b) the human processes of collaboration; and (c) the process of educational change.

The TIE Model consists of: (a) a conceptual framework (cf. Figure 1), (b) four sets of training materials, and (c) the Concerns-Based Adoption Model methodology for implementation and evaluation. The first set of training materials introduce the model and the three components of its conceptual framework. The second set consists of the training manuals for the three elements of instruction (i.e. curriculum correspondence, instructional organization, and monitoring progress). The third set relates to facilitation support strategies, and the fourth set to leadership functions.

The purpose of Phase II (October, 1989 to September 1991) was to implement the TIE model and evaluate its impact on teachers' concerns about and their use of technology.

METHOD

Participating schools

Implementation of the TIE Model in Phase II began in August of 1989. Model implementation activities continued through May of 1991. During the first year of Phase II, implementation began in a total of 11 buildings (three buildings in three Local Education Agencies, LEAs, and two buildings in one LEA). All four of the LEAs that participated in year one were in Maryland which organizes LEAs by counties. Therefore, these LEAs are referred to as County 1, 2, 3, and 4 respectively. County 1 is predominantly a suburban county, but in recent years portions of it have become increasingly urbanized. County 2 is a rural county. Counties 3 and 4 are both a combination of rural and suburban areas.

There were seven preconditions that needed to be met for entry into the project.

1) The district had a compatible approach to using technology;

2) A lead central office staff person (Special Education or Instructional Technology) designated three schools to participate;

3) A central office staff person served in the role of District TIE Liaison;

4) One building administrator and one other building level support person served in the role of Internal Change Facilitator, ICF;

5) At least six teachers per building agreed to participate. The required distribution at the outset was at least one resource room teacher and at least four regular education teachers;

6) Teachers had minimum computer access for their students equivalent to one half a computer;

7) Teachers had access to software with curriculum correspondence and monitoring progress features;

In addition to these seven preconditions for year one participation, the schools were required to a) complete training on the Curriculum Correspondence and Instructional Organization elements; b) participate in the implementation of the innovation for the 1989-90 school year; and c) complete the evaluation measures. Further participation in 1990-91 school year was presented as an option.

Training

The training for teachers was organized according to the three elements of instruction derived from Phase I research: Curriculum Correspondence (CC), Instructional Organization (IO), and Monitoring Progress (MP). These principles were based on sound instructional practices and can be elaborated as: (a) Computer-assisted instruction should correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum; (b) The use of the microcomputer should be an integral aspect of organizing students for instruction; and (c) The consistent monitoring of student progress should be supported by technology.

The four CC and IO training sessions were conducted in the following sequence: Orientation, Planning, Use, and Evaluation.
All of the CC and IO training sessions were conducted at each of the participating schools. The sessions were scheduled into 75 minute time slots on the same day of the week. These slots varied from before the instructional day, to mid-morning, to extensions of the teachers' lunch, and to the last activity of the day. In some cases the teachers were asked to report early or stay late. The most typical pattern was for the session to begin about 30 minutes before the end of the instructional day. The session would continue through the 20 or 30 minutes of non-instruction, contracted time at the end of

the day and require that the teachers stay 15 or 20 minutes beyond the contracted time. In some cases the sessions were scheduled early in the morning and required as much as 30 minutes of non-contract time. In three schools the teachers did not have to give up any non-contract time. In one of these schools the teachers were given an extended lunch time and permission to leave the building. In two of these schools the trainer repeated the sessions a second time to accommodate the teacher's scheduled planning time.

The training materials were modularized manuals which included Instructor's Notes, Handouts, and Transparencies. A copy of these manuals can be found in Appendix C. The process that was followed was based on Joyce and Showers (1983) recommendations for staff training and was highly interactive. At least one third of the time was spent at the computer with hands-on practice. Typically this practice occurred during the last part of the session.

Participants anonymously completed a seven item evaluation form, rating each item on a five-point Likert scale from strongly agree to strongly disagree at the end of each session.

The teachers were not given any direct incentives. The participating schools were given a budget of $200 for one year of participation and $300 for two years of participation. This money was earmarked for the purchase of software or computer supplies.

Six schools from three counties (Counties, 2, 3, and 4) indicated an interest in continuing in the project for the second year and completing Monitoring Progress training. A total of 10 teachers participated in the Monitoring Progress training. All of these teachers participated in the posttests following the Monitoring Progress training. An additional thirteen teachers (for a total of 23 teachers from 3 counties) who participated in year one training and assessment, but not in the MP training, also participated in the post-MP testing.

All of the group sessions for year two were held at a central location. There were two half-day sessions of training on MP for the 10 participating teachers. One session focused on teacher strategies and one focused on student strategies. A half-day session on Support and a whole-day session on Leadership was also conducted for the Internal Change Facilitators. In addition, individual consultation sessions were conducted at the respective buildings.

Assessment Procedures

The three Concerns-Based Adoption diagnostic dimensions (i.e., Stages of Concern, SoC; Levels of Use, LoU and Innovation Configuration, IC) were used to develop measures that reflected the Technology Integration Enhancement Model, (TIE).

The first measure, the Stages of Concern (SoC) Questionnaire addresses how individuals perceive an innovation, and how they feel about the effects of implementing it (Hall, George, & Rutherford, 1979). It is a 35-item paper and pencil measure that requires only 10 to 15 minutes to complete. Extensive research has established its validity and reliability. The questionnaire includes seven types of concerns that individuals experience as they proceed through the change process. These range from early concerns about "self," to concerns about "task," and finally to concerns about "impact". The SoC Questionnaire employs the standard 35 Concerns-Based Adoption items and scoring procedures. For our purposes, the directions accompanying the questionnaire informed teachers that the innovation mentioned in the items is Technology Integration Enhancement. The SoC Questionnaire is included in Appendix A.

The Levels of Use (LoU) Interview was designed to capture how an individual's performance changes as s/he becomes more familiar with an innovation and more skillful at using it (Loucks, Newlove, & Hall, 1975). Whereas, the Stages of Concern dimension focuses on perceptions about the innovation; Levels of Use focuses on whether or not, and how the educator is using an innovation. Eight distinct Levels of Use have been identified. Typically an individual begins with LoU O "non-use" of the innovation, then moves to LoU I "orientation" about the innovation and LoU II "preparation" for use. Initial use is typically at LoU III "mechanical," but as experience increases, innovation users progress to a LoU IVA "routine" level of use and eventually may reach various "refinement" levels (LoU IVB, V, VI), where changes are made based on formal or informal assessments of student needs.

The TIE LoU Assessment is a structured interview. The teacher verbally describes his or her current technology integration efforts in response to a set series of questions. The focused interview format gives the interviewer some latitude to elicit the interviewee's responses based on responses to previous questions. The eight distinct Levels of Use are descriptions of the user's behavior. The descriptions associated with the respective levels do not reflect attitudinal, motivational, or any other affective aspect of the user in relation to TIE. The majority of the teachers gave their permission for their interviews to be recorded on audio tape. The teachers' verbal descriptive responses to the structured questions are rated. The result is the designation of the teacher's level of use of the TIE innovation. A copy of the LoU Interview questions is included in Appendix A.

The third diagnostic dimension, Innovation Configuration (IC), is very important for understanding and describing the change process. The IC

Assessment orders the range of teacher behavior by the degree of use of the particular innovation and describes the various operational forms of an innovation that result as individuals adapt it for use in their particular setting (Heck, Stiegelbauer, Hall & Loucks, 1981). With this measure, the major operational components of an innovation are identified, and ways that each of the components can vary are described. Summary descriptions of these components are provided on the Innovation Configuration Component Checklist. The IC Component Checklist is innovation specific and can be used to record the ways each potential user is using the various parts of the innovation.

The TIE IC Assessment is primarily an observational measure that incorporates interview questions and document review. The TIE IC Assessment procedure reflects the Twelve Essentials for the Instructional Integration of Technology. Specifically, it is designed to operationalize the components of the three TIE elements (i.e. curriculum correspondence, instructional organization, and monitoring progress). The individual teacher's efforts are rated as implemented, partially implemented, or not implemented on each component. Appendix A includes the TIE IC Assessment Instrument used for the purposes of this project.

As Table I shows, a total of 37 teachers participated in the data gathering for pretesting before the first session and posttesting following training in Curriculum Correspondence and Instructional Organization on the Stages of Concern Questionnaire. IC data were collected from 45 teachers and LoU data from 46 teachers at these two measurement points. The number of teachers reported in Table I is slightly less than the number who received training due to the fact that only those teachers who participated at both administration points are included. For example, a teacher may have been unavailable for either the pre or post CC/IO assessment. Thus, their score on the single assessment is not included in Table I.

Additional data were collected for 19, 22, and 23 teachers for SoC, LoU, and IC Assessments respectively after the Monitoring Progress training was held.

Administration and Scoring Procedures

All the IC Assessments and LoU Interviews were administered by CBAM trained and certified Technology Integration Project Staff. The requisite observation and interview were conducted at the teachers' schools according to a mutually agreed upon schedule. The IC Assessments and LoU Interviews were typically conducted on the same day. The Pre-Training Assessments were conducted and scored by the project staff person who was to be the trainer in that building. The rationale for the prospective trainer being the evaluator is that the pre-training evaluation process serves a needs assessment purpose. The SoC questionnaire was given to teachers at the end of the LoU interview. They were asked to return it to the TIE evaluators or mail it to them in the provided addressed envelope.

For the Post-CC/IO Assessment and the Post-MP Assessment the evaluator was a project staff person other than the trainer. The rationale for this approach is that the teachers would be more comfortable with someone other than their trainer and might more accurately reflect their progress and concerns.

The SoC Questionnaires were scored by hand by members of the project team. Reliability was established (100%) by scoring of three teachers' profiles by separate staff members. Individual teacher profiles were developed for each teacher, and teacher high points of concern were identified via standardized scoring procedures. The were two evaluators for approximately 10% of the IC Assessments and 10% of the ratings of the LoU Interviews. Inter-rater/observer reliabilities were higher than 85% in all cases.

RESULTS

Stages of Concern

Figures 2 through 14 present the results of the Stages of Concern questionnaires returned from 37 teachers from nine schools before training and post CC and IO. In addition, posttraining SoCdata are available for 19 teachers from six schools.

Pretraining results

Figure 2 indicates that eight (22%) of the participants were at the Awareness (0) stage of concern, indicating that they had little concern or involvement with the innovation prior to training. Sixteen (43%) of the respondents proved to be at the Informational (1) stage. At this stage, a general awareness of the innovation and interest in learning more detail about it is indicated. These individuals are not worried about themselves in relation to the innovation, but rather are more concerned with substantive aspects such as requirements for use, general characteristics, and effects. Ten (27%) of the profiles indicated extreme personal concerns, placing them at Stage 2. These individuals are uncertain about the demands the innovation will make on them and their ability to meet those demands. Financial or status implications for themselves or their colleagues may also be reflected. Two (5%) of the respondents indicated that they had extreme management concerns. These were teachers whose attention appeared to be focused on the processes and tasks of using the innovation. Issues related to efficiency, organizing, management, scheduling, and time demands were central to these teachers.

One teacher indicated that his/her concerns were at the Consequence (4) stage which implies a concern for the relevance of the innovation for students, as well as evaluation of student outcomes, including performance and competencies. Four (11%) respondents indicated that they were concerned about the innovation at the Collaboration (5) stage. This highpoint coupled with high Awareness usually indicates that the person is concerned about looking for ideas from others, rather than working with others to implement the innovation.

Post Curriculum Correspondence (CC) and Instructional Organization (IO) assessment

As can be clearly seen in Figure 2, there was a definite shift to higher levels of concerns after training. Only one teacher's concerns remained solely at each of the first two stages (i.e. Awareness and Information), although several indicated that they still had awareness and information concerns. Twelve (32%) of the teachers still had intense personal concerns. Fourteen teachers (38%) were most concerned with the management aspects of the innovation, including time, scheduling, and classroom organization, while four (11%) cared most about the impact of the innovation on their students, and six (16%) were now concerned about genuine collaboration with colleagues to make the innovation work. Three (8%) of the respondents' concerns were at the Refocusing (6) stage, indicating that they were considering extending the innovation or considering total re-direction.

Posttraining Assessment

Figure 2 shows the changes in stages of concern across all counties. Since teachers from County 1 did not participate in MP training , this county is not represented in the posttraining data. The data in Figure 2 reveal a classic shift across stages of concern after training. The majority of teachers had peak stages at Awareness and Informational stages during the pretraining assessment, at the Personal and Management stages at the post CC and IO assessment, and finally at the Collaboration and Refocusing stages at the posttraining assessment. Almost 30% of the teachers had a highpoint at the Management stage after training. This reveals a continuing concern for ways to organize and orchestrate the innovation.

Figures 4-6 show the percentage of teachers with highpoints at the respective stages of concern at the posttraining assessment point. These data include the ten teachers who participated in the Monitoring Progress training. There were four teachers from County 2, three from County 3, and three from County 4 who participated in this training.

Analysis by County/LEA

Figure 3 shows that 75 percent of the teachers from LEA 1 expressed their greatest concerns at the first three stages at the Pretraining assessment point. Nineteen percent had their peak stage at Collaboration (5) and six percent at Refocusing (6). After Curriculum Correspondence and Instructional Organization training, no teacher had their peak stage at Awareness or Informational. The percentage of teachers at Stages 2, 3, 4, 5, and 6 were 19%, 44%, 6%, 6% and 25% at the Post CC and IO assessment.

Figure 4 shows that the highpoints for over 80% of teachers from County 2 were at the Awareness (0), Informational (1), and Personal (2) stages during the pretraining assessment. After training in Curriculum Correspondence and Instructional Organization (i.e. post-CC & IO) the percentage of teachers with peak stages at the Personal (2) and Management (3) stages exceeded those at other stages. After training in Curriculum Correspondence, Instructional Organization, and Monitoring Progress, there was a continued shift to more advanced stages of concern with over 30% of the teachers expressing concerns at the Refocusing (6) stage.

Figure 5 shows that prior to training most County 3 teachers' concerns were at the first three stages (i.e. awareness, informational, personal). After training in Curriculum Correspondence and Instructional Organization personal and management issues became predominant. After training in Curriculum Correspondence, Instructional Organization, and Monitoring Progress 50% of the teachers expressed concerns at the Management (3) stage with 25% at the Collaboration (5) stage.

Figure 6 shows that the concerns for the teachers in County 4 were primarily at the Awareness (0) , Informational (1) , and Personal (2) stages prior to training. At the Post CC and IO assessment, the majority of teachers had their peak stages at the Personal (2) and Management (3) stages. At the posttraining assessment point, the peak stages were Personal (2) and Refocusing (6).

Analysis by Teacher

Figures 7-14 illustrate each teacher's relative intensity of concern across the seven stages. Figures 7-14 represent the data for the eight teachers (5 from County 2 and 3 from County 4) who completed the SoC questionnaire before training, after training in Curriculum Correspondence and Instructional Organization, and again after training in Monitoring Progress (N=5) or one year after the initial CC and IO assessment (N =3). Teachers 1, 2, 3, 7, and 8 received Monitoring Progress training. Teachers 4, 5, and 6 did not receive Monitoring Progress training but were assessed at posttraining.

Teacher 1's profile reflects an inexperienced user at pretraining; a user concerned with personal issues at post CC and IO; and a user with relatively high management, consequence, collaboration, and refocusing concerns at the posttraining assessment point (cf. Fig. 7). Interestingly, the most intense concern at posttraining was the need for additional information.

Figure 8 shows that Teacher 2's profile reflects the fact that many items were of high concern. With the exception of the lack of concern for refocusing issues at the pretraining assessment, Teacher 2's pattern of concerns did not shift across time. This profile reflects a relatively experienced user from the outset.

The profile for Teacher 3 is relatively consistent at all three assessment points with the major change occurring at the Collaboration and Refocusing stages from pretraining to post CC and IO which was sustained at the posttraining point.

Teacher 4's profile shows a progressive decline in concerns at the Informational and Personal stages with each administration of the questionnaire. CBAM interpretation guidelines suggest that individuals who are experienced users of the innovation tend to have high Awareness (Stage 0) scores and low Information and Personal (Stage 1 and 2) scores. For nonusers of the innovation, a high peak score on Stage 0 reflects awareness of and concern about the innovation, whereas for users of the innovation, a high score on this stage indicates lack of concern about the innovation. This pattern seen with Teacher 4 reflects the fact that the teacher is no longer preoccupied with the innovation because it has become routine.

Figure 11 shows that Teacher 5 maintained a high need for information at the three assessment points. Even though this teacher did not participate in MP training, she became concerned about the consequences of the innovation for her students, collaborated with other teachers, and had refocusing as her peak stage at the posttraining assessment point.

Figure 12 shows that Teacher 6 began with a typical pattern for a nonuser, with predominant concerns at the Awareness and Information stages. These concerns became less salient, but still present, by the second and third assessment respectively.

Figure 13 shows that Teacher 7's major concerns were at the Awareness and Collaboration stages before training. Concerns about Awareness lessened while collaboration concerns remained consistently high across assessment points. Also, a shift to concerns related to consequences of the innovation, collaboration, and refocusing was observed after the curriculum correspondence and instructional organization training. This shift continued, but management concerns also were a factor after this teacher participated in Monitoring Progress training.

Figure 14 shows that Teacher 8's major concerns were clustered at the first three stages before training. Teacher 8 had intense informational, management, and personal concerns at the posttraining assessment. Although lower than the teacher's pretraining concerns, they were actually higher than the post-CC & IO assessment.

Conclusions and Discussion

The SoC data aggregated by County show a change across time in peak stage scores. Initially, the peak scores were at the Awareness and Information stages. Teachers in each county demonstrated more intense concerns relative to management, consequence, collaboration, and refocusing issues after training in Curriculum Correspondence and Instructional Organization which, for the most part, was sustained a year later at the posttraining assessment point.

A more sensitive interpretation of the SoC results can be developed by analyzing the individual users' profiles. These results (Figs. 7-14) include the percentile scores for all seven stages and yield more precise information relative to users' concerns and attitudes regarding the innovation. The fact that not all teachers returned these questionnaires at each of the three assessment points resulted in a small sample for this analysis.

Since the SoC is a general measure of affect and attitude regarding the innovation, it is not unusual that the teachers who did not participate in Monitoring Progress training (cf. Figs. 10-12) showed the same patterns of those who participated in this training (Figs. 7, 8, 9, 13, 14). There was no particular item or set of items in the questionnaire which dealt with progress monitoring or related issues. Rather, the items were worded to include the TIE model as a unit.

Assuming the developmental nature of concern, the second highest stage of concern will often, although not always, be adjacent to the highest stage. This pattern was observed for seven of the eight teachers at the pretraining point, for four of the teachers at post CC-IO, and for four teachers at the posttraining assessment. Thus, the high/second high adjacent combination pattern was not entirely substantiated with the eight teachers who completed all three questionnaires.

Collectively, the data presented in Figures 1-14 support a key tenet of the CBAM model, namely, that innovation adopter concerns changes in a logical progression as users become increasingly skilled in using the innovation (Hall & Hord, 1987).

Levels of Use

Figures 15 through 25 depict the results of the Levels of Use interviews. Pretraining and Post-CC and IO Levels of Use interviews were completed for 46 teachers from eight schools. In addition, Posttraining LoU interviews were completed for 22 teachers from seven schools.

A comparison of the Pretraining assessment with the Post-CC and IO and Posttraining data provides a change index with increased percentages of teachers in LoU categories from left to right indicating progress. In other words, movement along the horizontal axis from Level 0 or Non-use to Level VI or Renewal indicates progress.

Figures 15-17 depict the results based on teachers' self-reports in three County 1 schools. For the most part, teachers in this county were at Levels II and III before training. Over 60% of the teachers from School 102 reached Level IVA or higher after CC and IO training. County-wide, 83% of the teachers were at the Mechanical Use or higher after CC and IO training.

Figures 18-20 depict the results for teachers from three schools in County 2. As with County 1, many teachers were at Level II (Preparation) before training. After training in CC and IO , changes to higher levels of use were reported, particularly by teachers in School 202. Schools 201 and 203 also completed the LoU interviews at the Posttraining assessment point (i.e. after training in monitoring progress or one year after the Post CC-IO assessment). These results reflect a further shift to higher levels indicative of sustained use of the innovation and revising it to increase students outcomes (Level IV B) or based on input from colleagues (Level V).

Figures 21 and 22 depict the results for two schools in County 3. The results reflect an expected pattern after the innovation has been in place for about one year.

Figures 23-25 depict the results for three County 4 schools. Teachers in School 401 and 402 participated in three assessments. Their profiles reflect the classic pattern of gradual movement from earlier levels (i.e. 0-III) to later levels (i.e. IVa and higher). Teachers in School 403 did not complete the interim measure (i.e. Post CC-IO) but did complete the Posttraining assessment. Their results also showed the predicable movement from earlier to later levels, but it was not as pronounced as that from the other two schools.

Thus, as can be seen by comparing the percentages at the pretraining and Post-CC and IO assessment points for all schools and also at the

Posttraining assessment point for seven schools, participants from each school have progressed.

Teachers in every school who received training in the TIE model demonstrated a shift in their level of use after training. They moved from spending most of their efforts in orienting, to managing, and finally to integrating the use of the computer.

Figure 26 presents a comparison of those teachers who received Monitoring Progress training with those who did not. As can been seen from an examination of these data, the two groups were very similar at the Posttraining assessment point.

Conclusions and Discussion

The developers of the CBAM model contend that Levels of Use should be accepted as defining legitimate steps in growth toward sophisticated use (Hall & Hord, 1987). They further suggest that strategies must be developed to address a user's present LoU and facilitate growth. As was described in the Methods section, the trainer conducted the LoU interview, thus gaining insight for the formal sessions and informal assistance. This factor may have partially accounted for the growth reported by the teachers themselves.

The initial objective of the TIP project was to have teachers attain Level IV A which represents the fact that the routine use of the innovation has stabilized. Few if any changes are being made in the everyday use of the TIE model at this level.

Hall, Loucks, Rutherford, and Newlove (1975) report that 30-40 % of an innovation's users are stable at LoU IV A after three cycles of use. We found that 55 % of the users who received training in curriculum correspondence, instructional organization, and monitoring progress reached LoU IVA. However, 85 % of the users were at LoU IVA or higher. Twenty-five percent of the teachers who only received training in curriculum correspondence and instructional organization reached LoU IV A at the Posttraining assessment point.

There are several factors which might have accounted for the fact that 55% of the teachers reached Level IV A. As was noted in the Methods section of this report, the building principal provided a person to function as an internal change facilitator (ICF). In the instances where this person was a computer coordinator, s/he responded to teachers' needs to further implement the model and expand its use. Another possible explanation for the gains achieved by more than half of the teachers might be their perception of involvement in a special project. More likely, the improved Level of Use was due to the fact that the TIE training sessions were premised on the SoC questionnaires and LoU interviews, and thus directly addressed the concerns of particular teachers.

The finding that there was no substantial change in teachers who received monitoring progress training and those who did not may be due to the fact that the LoU like the SoC measure the TIE innovation as a unit, rather than a particular aspect of it.

Innovation Configuration

Two concepts are critical for the purposes of the analysis of innovation configuration data: (a) components and (b) variations. Components are the major features of an innovation. In our research, there were four components for Curriculum Correspondence and Instructional Organization and three components for the Monitoring Progress element. There were four to five variations for each component in the TIE model. These variations represented teacher behaviors which reflect full implementation, partial implementation, or lack of implementation of the innovation configuration component. For the purposes of data presentation, the two categories of full and partial implementation were collapsed to constitute an implementation category.

As can be seen from a review of the innovation configuration data in Figures 27-29, substantial positive shifts were seen from the pretraining to post CC/IO assessment points. These gains were observed across teachers, schools, elements, and components.

Analysis by elements and components

Figure 27 shows that a larger percentage of teachers were implementing the curriculum correspondence components of use and short term planning (i.e., 77.7% and 77.8% respectively) after CC/IO training than the other components (i.e. advance planning and evaluation). The largest change occurred in the area of advance planning where a 50% increase was observed from pre to post CC/IO assessment points. The smallest change occurred in the area of evaluation where a 16.7% increase was observed.

Figure 28 shows that a larger percentage of teachers were implementing the instructional organization component of use (63.7%) than the other three components at the post IO/CC assessment. The largest increase (38.3%) also occurred in the area of use. Increases from pre to post CC/IO training measurement points were very similar for advance planning, short-term planning, and evaluation ranging from 28.1% to 28.9%.

As Figure 29 shows, a larger percentage of teachers (49.7%) was implementing the planning component of monitoring progress after CC/IO training than the other two components. The largest increase (36.8%) also was observed in the planning component.

Posttraining Assessments

Figures 27-29 show the posttraining results for two groups of teachers (i.e. post-MP and follow-up). The post-MP group consisted of 10 teachers who received monitoring progress training. The Follow-up group consisted of 13 teachers who did not receive monitoring progress training, but who were administered the IC assessment one year after the CC/IO assessment.

As can be seen from a review of Figures 27-30, substantial positive shifts were observed from pretraining to posttraining assessment points. In most instances, these gains exceeded those originally made at the post CC/IO assessment point.

Figure 27 shows that a larger percentage of post-MP teachers were implementing the curriculum correspondence components of use and short-term planning (i.e. 88%) than the components of advance planning and evaluation. The largest percent change (i.e. 38.1%) observed from post CC/IO to post-MP assessment occurred in the evaluation component.

Figure 28 shows that 100% of the post-MP teachers were implementing the Instructional Organization components of Short-term Planning and Use. Increases of over 36% were observed in three components (i.e. advance planning, short-term planning, and use).

Figure 29 shows that all of the Monitoring Progress components reflected modest gains from the post CC/IO assessment to the post MP assessment. The Plan component revealed the largest gain (i.e. 49.7 to 66%).

As Figure 30 shows, a larger percentage of the components (82.6%) were being implemented for the Curriculum Correspondence and Instructional Organization elements after Monitoring Progress training than for the Monitoring Progress element. The results of the posttraining assessment parallel those obtained at the post CC/IO assessment point with respect to the low percentage of Monitoring Progress components that were being implemented.

Follow-up Data

With respect to the curriculum correspondence element, evaluations for the follow-up only group revealed that the percentage of teachers who implemented the components of advance planning and use was the same as those who received monitoring progress training. The percentage of teachers implementing short term planning was higher for the follow-up teachers than the ones receiving monitoring progress training and lower for the evaluation component.

The percentage of teachers implementing the components of the instructional organization element during the follow-up observation was the same or slightly lower than for the teachers receiving monitoring progress training.

As expected, the percentage of the non-MP trained teachers implementing the components of the Monitoring Progress element during follow-up was lower than the percentage of teachers who received training in this area. In fact, this percentage of teachers was actually lower than the percentage of teachers implementing Monitoring Progress after the CC/IO training.

Conclusions and Discussion

As can be seen from the information presented in this summary, the TIP staff development procedures had a positive impact on the teachers' actual practices with respect to technology integration. The largest impact related to Curriculum Correspondence and Instructional Organization and less with Monitoring Progress. This finding may have been due, in part, to the fact that training in monitoring progress was the most recent and teachers may not have had time to incorporate all the nuances into their everyday routines. Traditionally, progress monitoring has been difficult to achieve due to time constraints and competing tasks. MacArthur and Malouf (1991) found in their case studies of four special education teachers, that monitoring student CAI performance was more demanding than monitoring paper-and-pencil seatwork. These authors note that checking CAI work requires "watching the screen, using record-keeping programs if available, or training students to self-record" (p. 70). These factors may have accounted for the relatively low percentage of teachers implementing components of the monitoring progress element.

The Innovation Configuration represents the one dimension of the CBAM model which taps actual use. Although the positive findings are encouraging, one cannot attribute them solely to the TIE model. The gains that were observed could have been due to any number of extraneous factors such as other county or school-wide inservices, peer support, administrative feedback, self-teaching, novelty effect, etc. The fact that the IC data corroborate the other measures (i.e. levels of use and stages of concern) suggests that the participating teachers are more receptive to and engaged in practices that promote technology integration than before their participation in TIP's staff development activities.

Several aspects of the TIE model may have been particularly salient in enabling teachers to integrate technology. First, although the training was not matched directly to each teacher's stage of concern, this information was available to the TIE trainer. The trainer adjusted the in-service sessions to these concerns, as much as possible within the group situation. A second, and possibly stronger factor, that could have accounted for the changes was the demand characteristic. TIP staff clearly communicated both to the ICF and to the teachers, that they would not only present information to the teachers but also assist them in their implementation efforts. Furthermore, these implementation efforts would build on and not seek to replace existing expertise of the teacher. By referencing the training in technology to best practices in education, teachers may have considered the training less threatening and less anxiety producing.

Session Evaluations

This section reviews the numerical session evaluation data collected at the end of each training session. Participants completed an evaluation form rating seven items on a five point Likert scale. The ratings were collapsed so that all ratings of 1, 2, or 3 were combined as a satisfactory evaluation of the training session and ratings of 4 and 5 were considered an unsatisfactory evaluation of the session.

Each figure contains the two graphs for the four sessions of addressing the Curriculum Correspondence and Instructional Organizational modules. Each graph represents the percentage of satisfactory and unsatisfactory evaluation responses for each module presented.

Figure 31 depicts the percentages of satisfactory and unsatisfactory evaluation responses from participating teachers in County 1. For the Curriculum Correspondence sessions, the percent satisfactory responses ranged from 84.7 to 92.5. The unsatisfactory responses ranged from 7.1 to 15.4 percent. For the Instructional Organization sessions, the percent satisfactory ranged from 82.5 to 95.7; unsatisfactory was 3.3 to 17.6.

Figure 32 depicts the evaluation responses from participating teachers in County 2. The percent of satisfactory responses ranged from 89.5 to 100 for the Curriculum Correspondence sessions. The unsatisfactory responses ranged from 0 to 10.5 percent. The percent satisfactory responses ranged from 90.9 to 98.3 for the Instructional Organization sessions. The unsatisfactory responses ranged from 1.6 to 9.1.

Figure 33 depicts the evaluation responses from participating teachers in County 3. For the Curriculum Correspondence modules, 96.5 percent rated the first session as satisfactory. All of the participants rated the remaining three sessions as satisfactory. All the ratings for the four Instructional Organization modules were satisfactory.

Figure 34 depicts the evaluation responses from participating teachers in County 4. The percent of satisfactory responses ranged from 98.1 to 99 percent for the Curriculum Correspondence sessions. Approximately one percent of the evaluation responses indicated unsatisfactory rating. For the Instructional Organization sessions, the percent satisfactory ranged from 90.9 to 98.3; unsatisfactory was 1.6 to 9.1.

The monitoring progress module was similarly well-received as 100% of the participants rated it as satisfactory.

The results of the session evaluations indicate that on a quantifiable rating scale, the ratings were generally quite satisfactory. For approximately half the session, all participants indicated satisfactory responses to the evaluation items. For the remaining sessions, the satisfactory responses ranged from 82.5 to 99.3 percent. Based on the high percentages of satisfactory responses on the session evaluations, it can be concluded that the participants generally regarded the training as satisfactory.

An analysis of narrative comments provided with the session evaluations suggests the participating teachers' expectancy for hands-on experience with software. The comments reflected a need for time to preview software in order to determine appropriate computer-assisted instruction (CAI) for their students. Generally, the comments indicated that the training sessions were sufficiently informative but that additional time is necessary to plan and implement the strategies for integrating technology suggested in the training modules.

DISCUSSION

The results of this project suggest that teachers' attitudes toward and use of technology changes across time with the provision of well-designed staff development. The project did not attempt to assess the academic gains realized by students as a function of technology integration. Any future study must focus on student outcomes as well as teacher variables. For example, the relationship of Levels of Use to student achievement could be explored. Is a Level III user able to generate the kinds of adaptations necessary to ensure positive student outcomes?

In addition to student gains, the contribution of technology integration to instructional integration needs to be examined. The extent to which students with disabilities are able to successfully compete in the regular classroom is an important outcome measure. Are more students successfully served in integrated environments as a function of access to CAI which can be easily tailored to individualized learning objectives?

In the present research effort, the trainers knew the Stages of Concern and Levels of Use of the teachers and accommodated their instruction based on this information as much as possible within a small group situation. However, this arrangement might not work well for a participant with a totally different profile from the majority of the group members. In future iterations of the TIE model, training could be more closely linked to each teacher's SoC and LoU profile through individualized exercises and assignments. Outcomes associated with this closer coupling could be investigated. In a recent study investigating the use of the CBAM model with teachers' acceptance of the consulting teacher model, the authors found that teachers at the Information Stage benefitted from instruction aligned with the Management Stage (Pedron & Evans, 1990). The authors interpreted this finding to suggest that interventions stressing organizational detail may be more effective for Informational Stage subjects than material designed directly for this stage (i.e., general descriptive material). Thus, there may be important caveats to recommending a one-to-one correspondence between training content and the participant's Stage of Concern.

As has been mentioned, the TIE innovation was multifaceted. It was not circumscribed. The TIE innovation consisted of (a) a series of formal training sessions; (b) hand-outs and resource manuals; (c) introduction to new software programs; and (d) technology assistance from the Internal Change Facilitator. Collectively, these interventions yielded promising results. Individually, each may have produced a somewhat weaker outcome. A component analysis would be needed to confirm this hypothesis, or, more importantly, to identify the minimum salient components for effective change.

One frequently used training technique, modeling, was not incorporated in the present TIE innovation. There were limited exemplars of classroom based best practices to secure and share before the project ended. Future studies or interventions might benefit from filmed or live demonstrations of ways to integrate instructional technologies into educational programs.

A more rigorous research design would provide more definitive data on the impact of the TIE intervention or its constituent parts. The present study did not rule out history, maturation, or practice effects as threats to internal validity. Future studies need to be longitudinal since both the intervention and the accompanying change require time. Major innovations such as represented by the adoption of technology often require a minimum of three to five years to be implemented properly (Bransford, 1984).

One of the major findings of the Phase I studies which was validated in Phase II is that technology is not self-implementing. Teachers are central and critical to its success. Just as teachers operate in an environment which provides sources of support (i.e. four realms) so, too, technology requires support to serve its intended function. This support comes in many forms of teachers' behaviors - selecting appropriate software, orienting students to relevant software features, and providing a bridge to non-CAI activities. It would be valuable to identify and investigate other forms of support such as teacher initiated technology integration practices for easing the transition from non-CAI to CAI or using CAI to monitor student progress.

Another research line to follow would be the assessment of new forms of technology into instructional routines. The present work focused on desktop computers and educational software. Do recent technologies such as notebook computers or speech recognition systems substantially advance or alter technology integration efforts? Perhaps a more provocative question concerns the generalization of teacher behaviors from existing to new forms of technology. Is this generalization enhanced by the training offered as part of the generic TIE model which was not premised on specific hardware and software configurations? The TIE model required only that certain access levels be present, not that access to particular types of computers be present.

The purpose of the TIP project was to develop an empirically derived and evaluated application model for integrating technology into the instruction of students with mild disabilities. Technology is also a major force in the instructional lives of students with severe disabilities. Are there additional or different interventions required to prepare teachers to master the integration of the seemingly more complex devices associated with this population? For example, in addition to selecting appropriate educational software, an alternate input device is often required for students with multiple disabilities. Do the substantial life enhancing outcomes associated with its use offset the difficulties in learning to use this equipment or in arranging for its use in educational contexts?

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Table 1 Participating Teachers

	Soc-Pre	SoCPCC/IO	Soc-Post		Lou-Pre	LouPCC/IO	Lou-Post		IC-Pre	IC-P-CC/IO	IC-Post	
County 1			MP	Fol			MP	Fol			MP	Fol
School 101	6	6	0	0	6	6	0	0	6	6	0	0
School 102	5	5	0	0	7	7	0	0	7	7	0	0
School 103	4	4	0	0	5	5	0	0	5	5	0	0
All	15	15	0	0	18	18	0	0	18	18	0	0
County 2												
School 201	5	5	3	0	6	6	3	0	6	6	3	0
School 202	0	0	1	3	0	0	1	3	2	2	1	3
School 203	5	5	0	2	5	5	0	2	5	5	0	2
All	10	10	4	5	11	11	4	5	13	13	4	5
County 3												
School 302	6	6	0	0	7	7	0	0	3	3	0	0
School 303	0	0	3	2	0	0	3	2	0	0	3	2
All	6	6	3	2	7	7	3	2	3	3	3	2
County 4												
School 401	1	1	0	2	5	5	0	2	6	6	0	2
School 402	2	2	2	1	5	5	2	1	5	5	2	1
School 403	3	3	0	0	0	0	1	3	0	0	1	3
All	6	6	2	3	10	10	4	4	11	11	3	6
Grand Total	37	37	9	10	46	46	11	11	45	45	10	13

THE *TIE* CONCEPTUAL FRAMEWORK FOR TECHNOLOGY INTEGRATION

Materials: Set 1

INSTRUCTION
ESSENTIALS FOR THE DELIVERY OF INSTRUCTION

SUPPORT
SPECIFIC FACILITATION SUPPORT STRATEGIES

LEADERSHIP
FOCUS ON PLANNING:
STRATEGIC CONCEPTS, TACTICAL STEPS and IMPLEMENTATION PROCEDURES

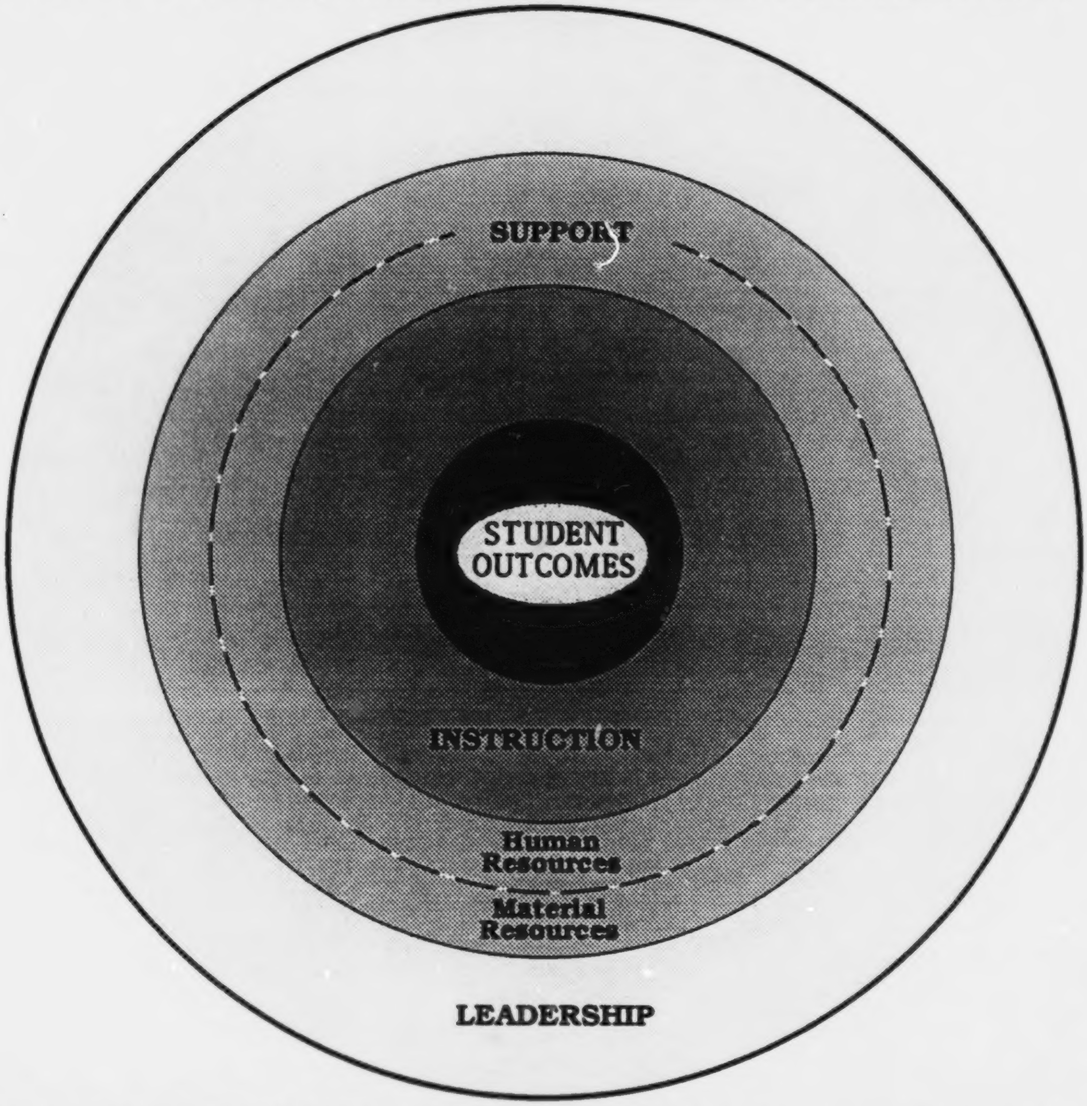
SUPPORT
STUDENT OUTCOMES
INSTRUCTION
Human Resources
Material Resources
LEADERSHIP

Fig. 1 The Technology Integration Enhancement Model's Conceptual Framework

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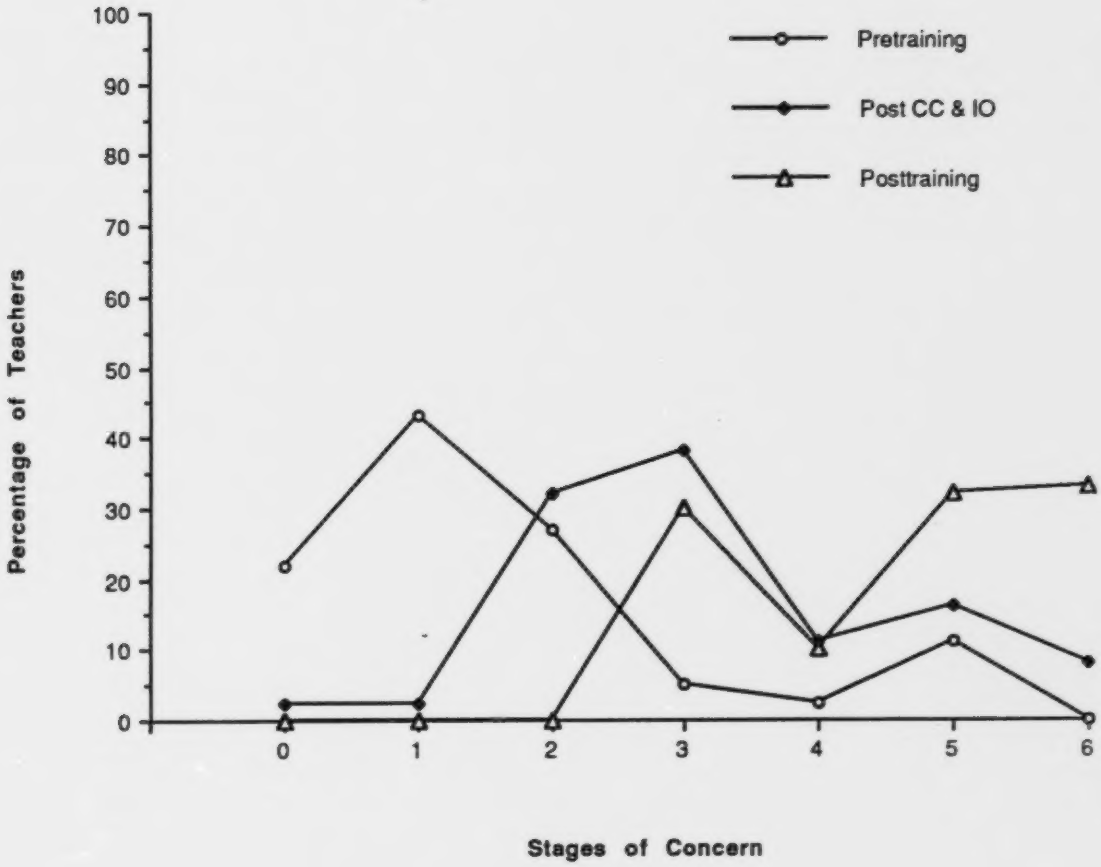


Figure 2. Changes in Stages of Concern Across all Counties

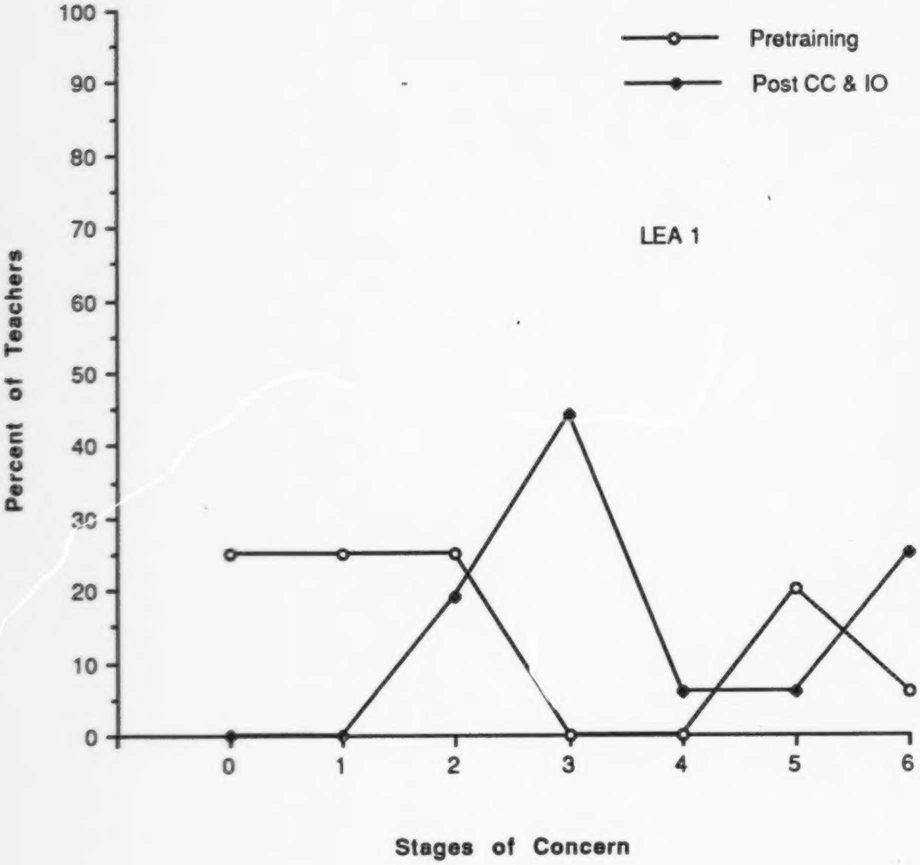


Figure 3. Percent of Teachers with Highpoints at Respective Stages of Concern

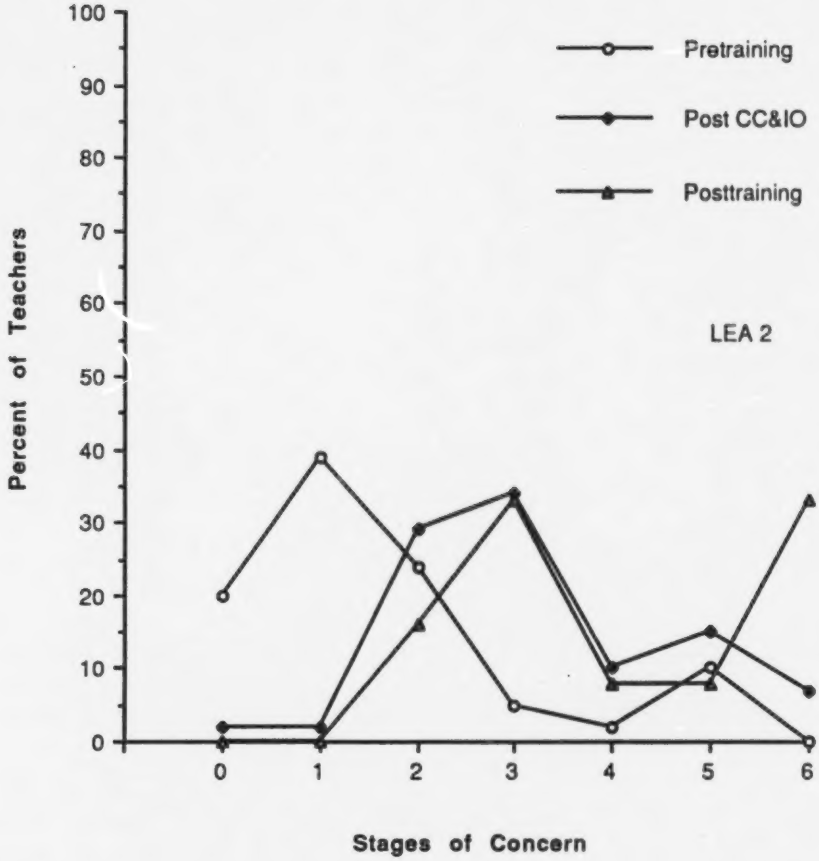


Figure 4. Percent of Teachers with Highpoints at Respective Stages of Concern

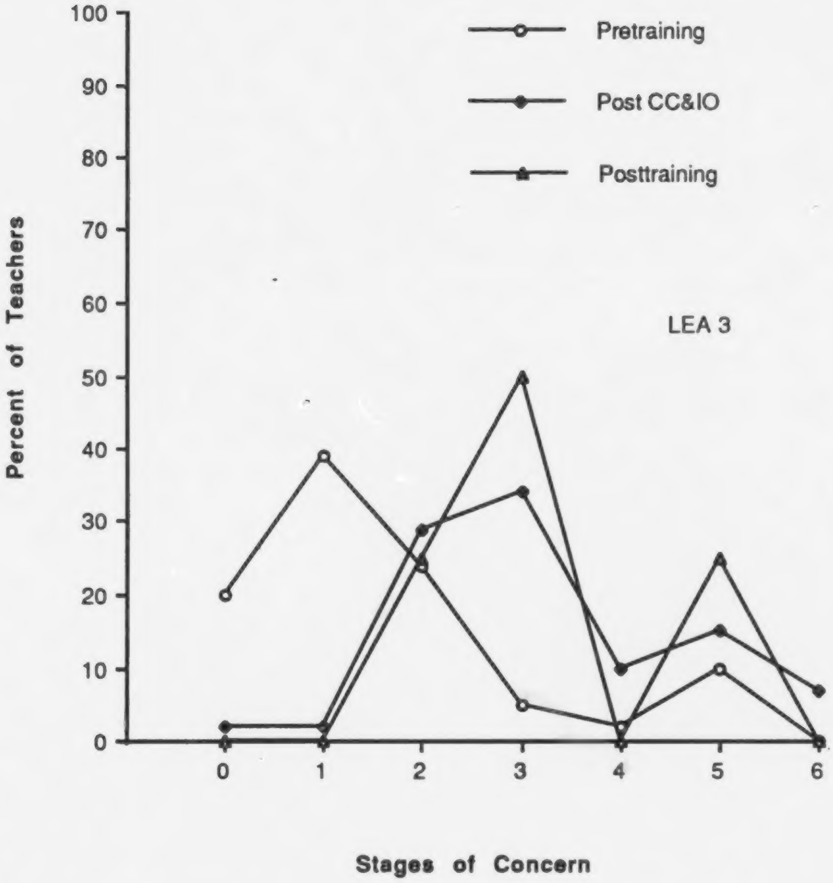


Figure 5. Percent of Teachers with Highpoints at Respective Stages of Concern

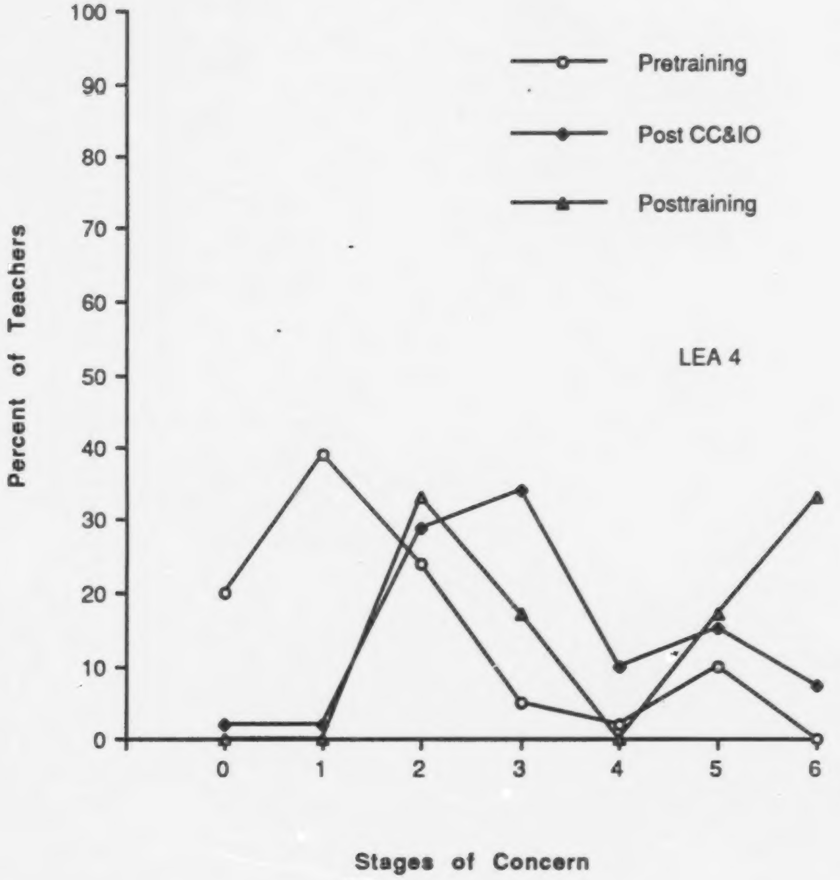


Figure 6. Percent of Teachers with Highpoints at Respective Stages of Concern

Figure 7. Individual profile for Teacher 1

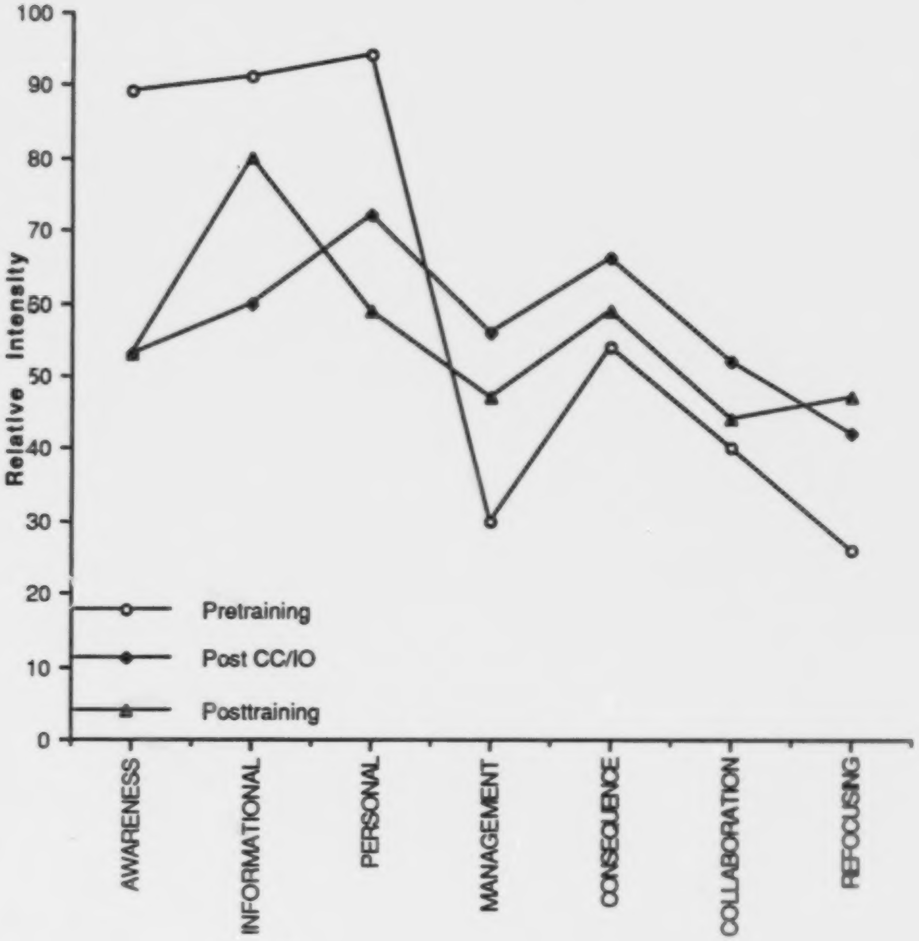


Figure 8. Individual profile for Teacher 2

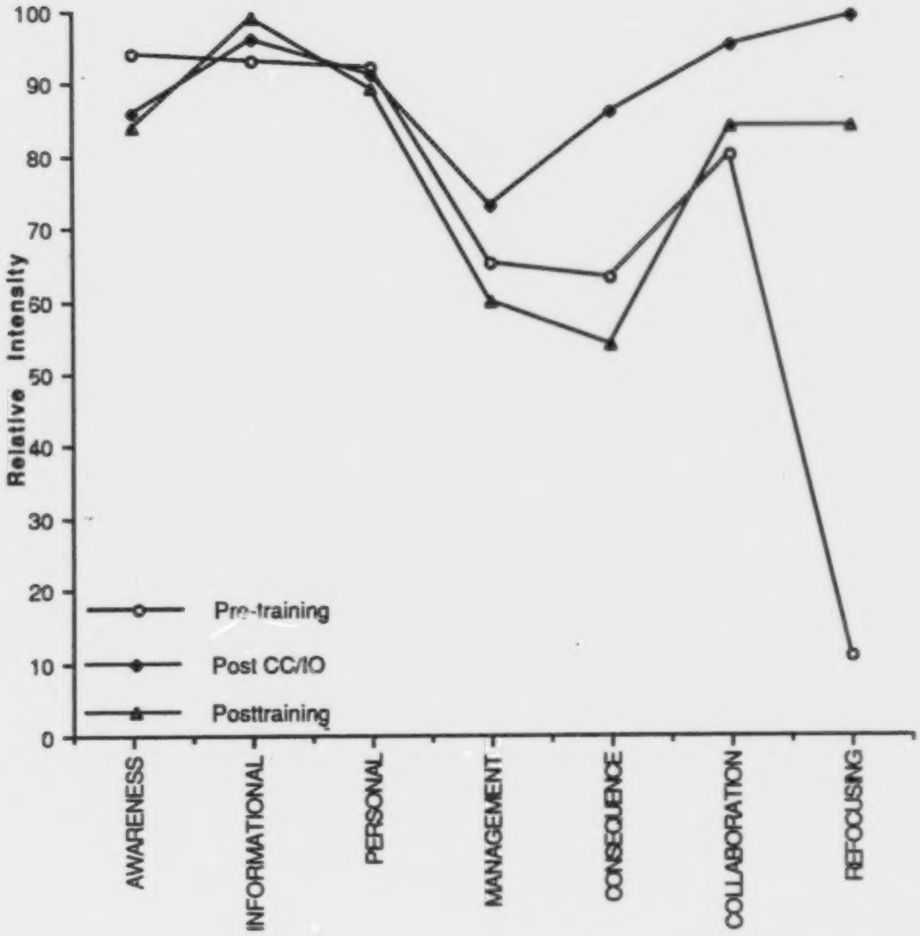


Figure 9. Individual profile for Teacher 3

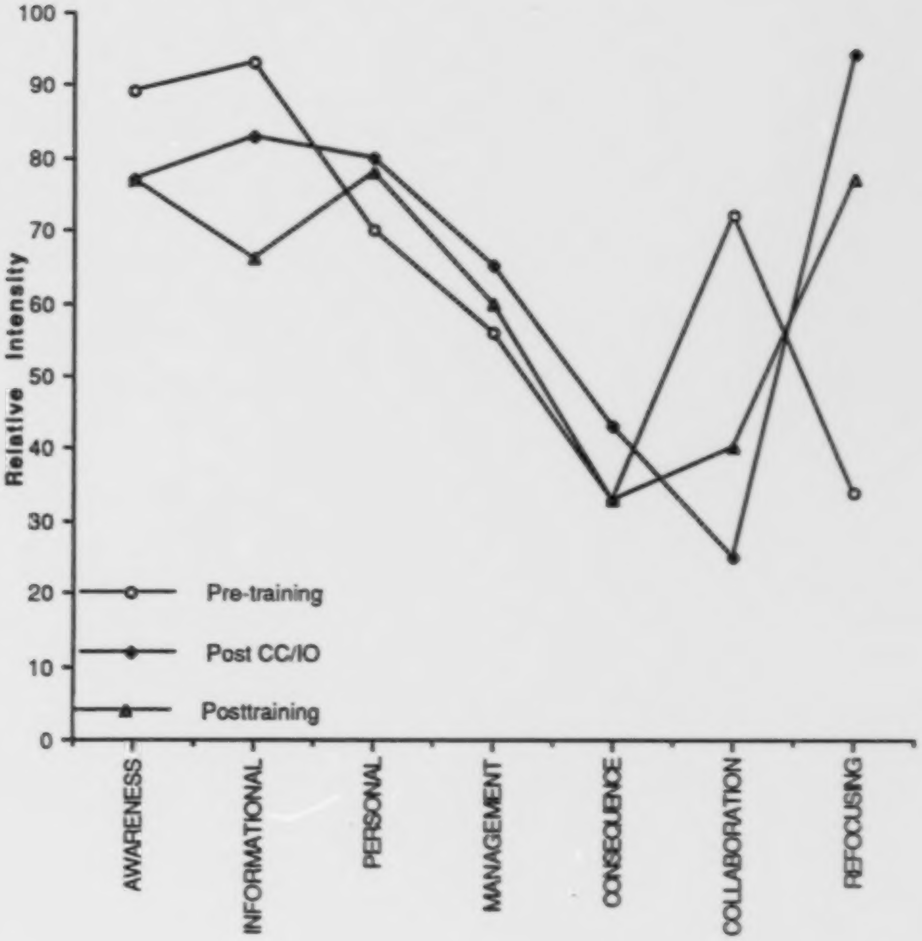


Figure 10. Individual profile for Teacher 4

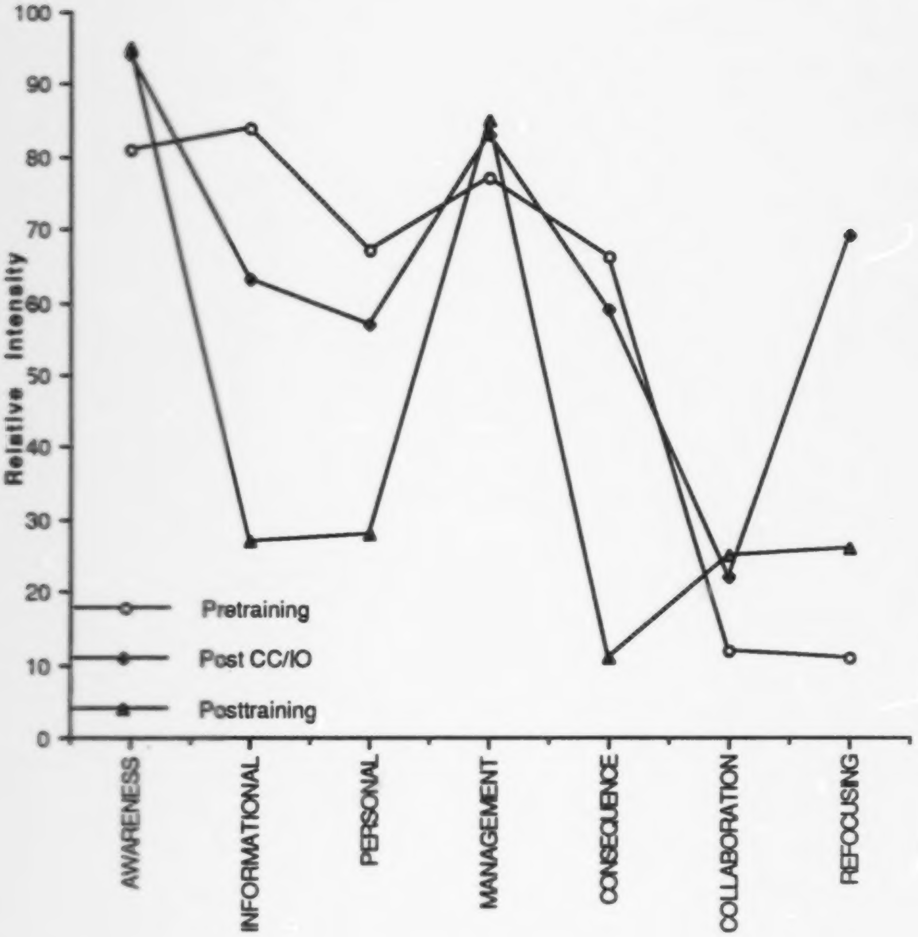


Figure 11. Individual profile for Teacher 5

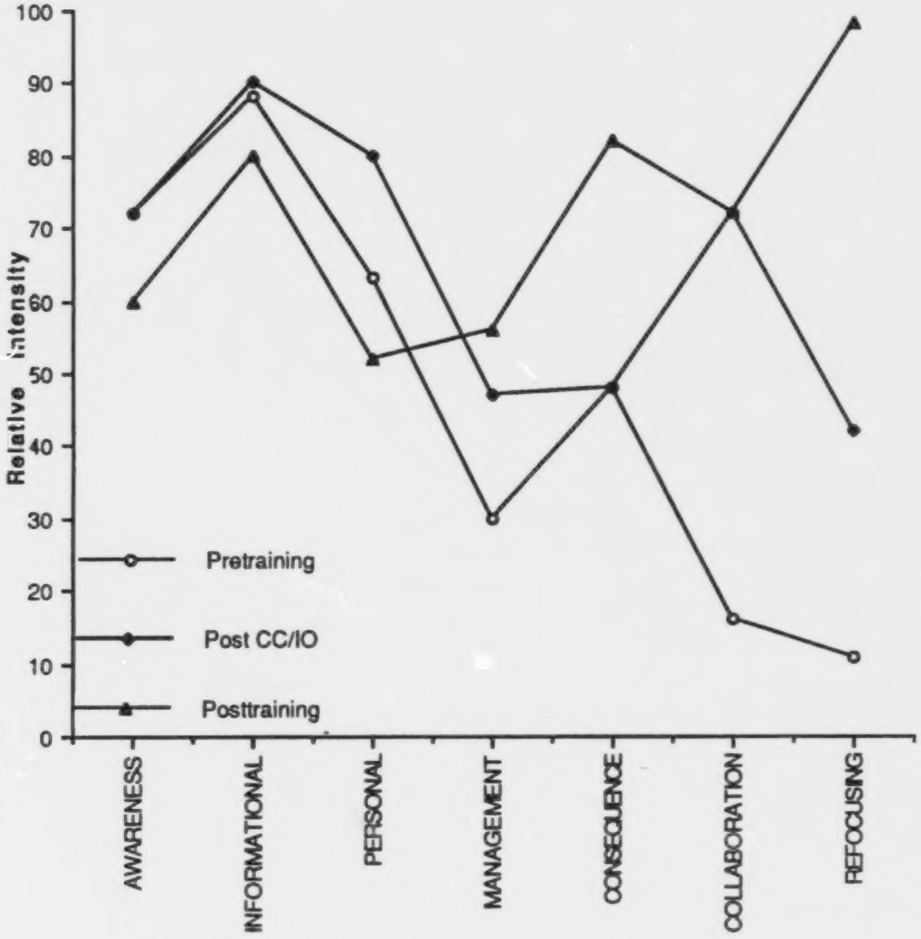


Figure 12. Individual profile for Teacher 6

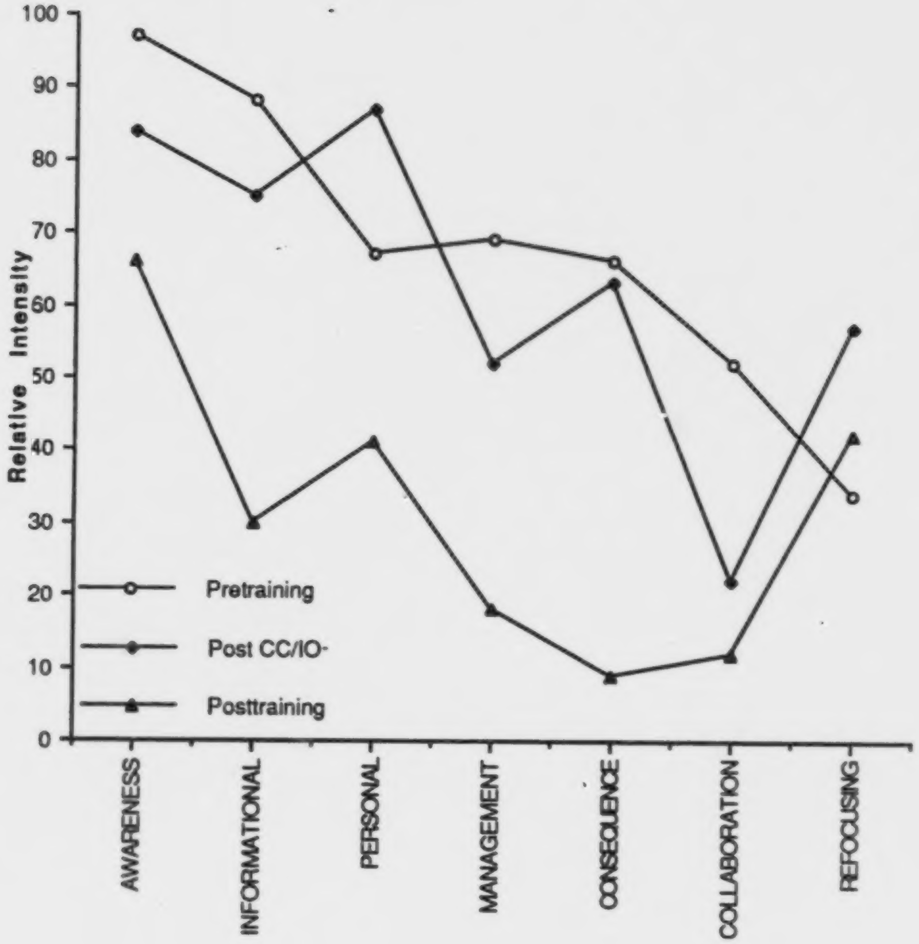


Figure 13. Individual profile for Teacher 7

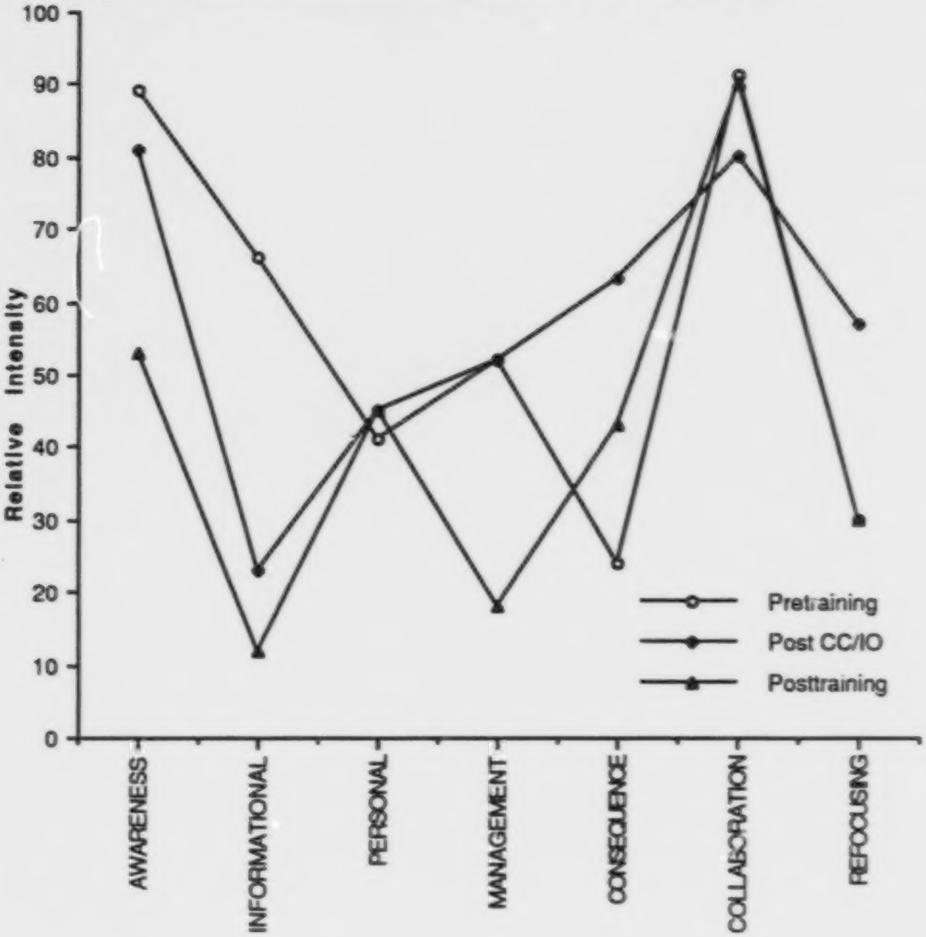
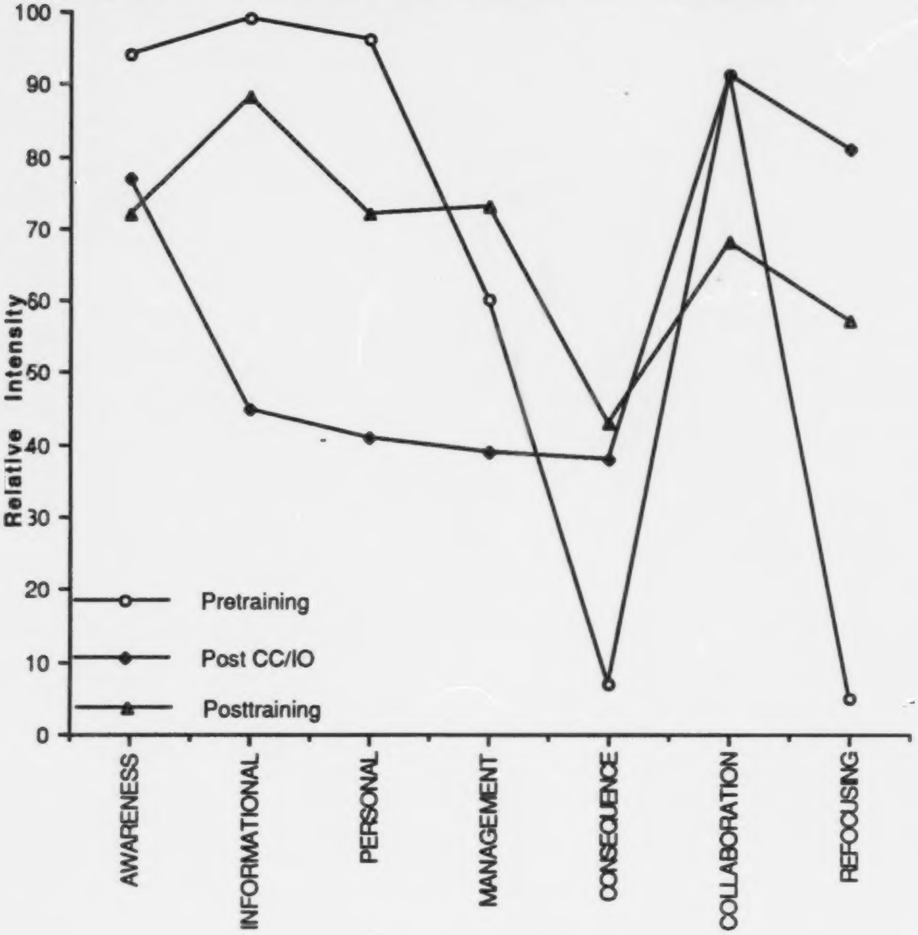


Figure 14. Individual profile for Teacher 8



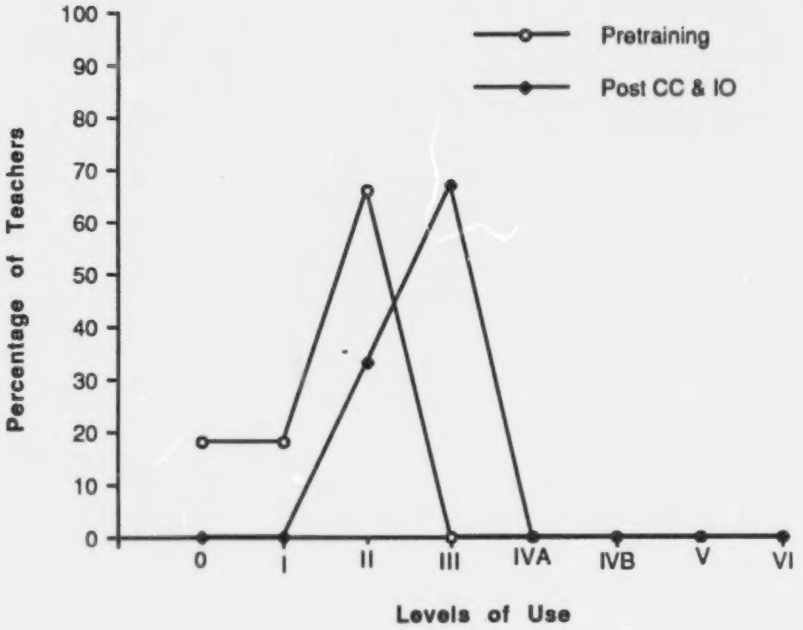


Figure 15. Percentage of Teachers at each Level of Use in Sch. 101

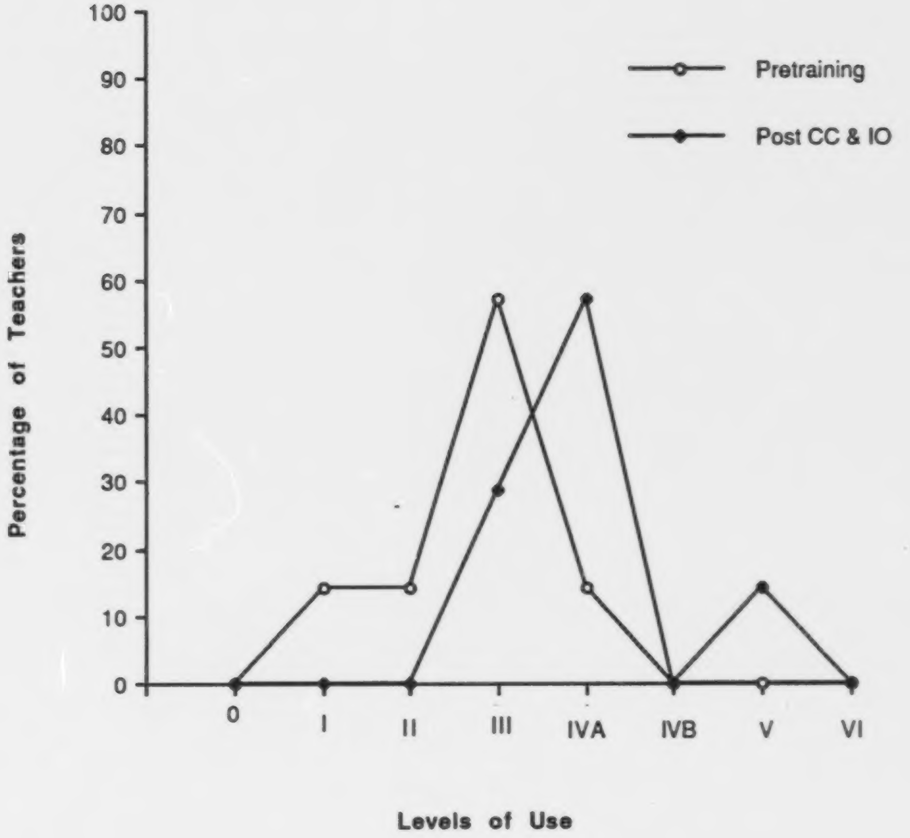


Figure 16. Percentage of Teachers at each Level of Use in Sch.102

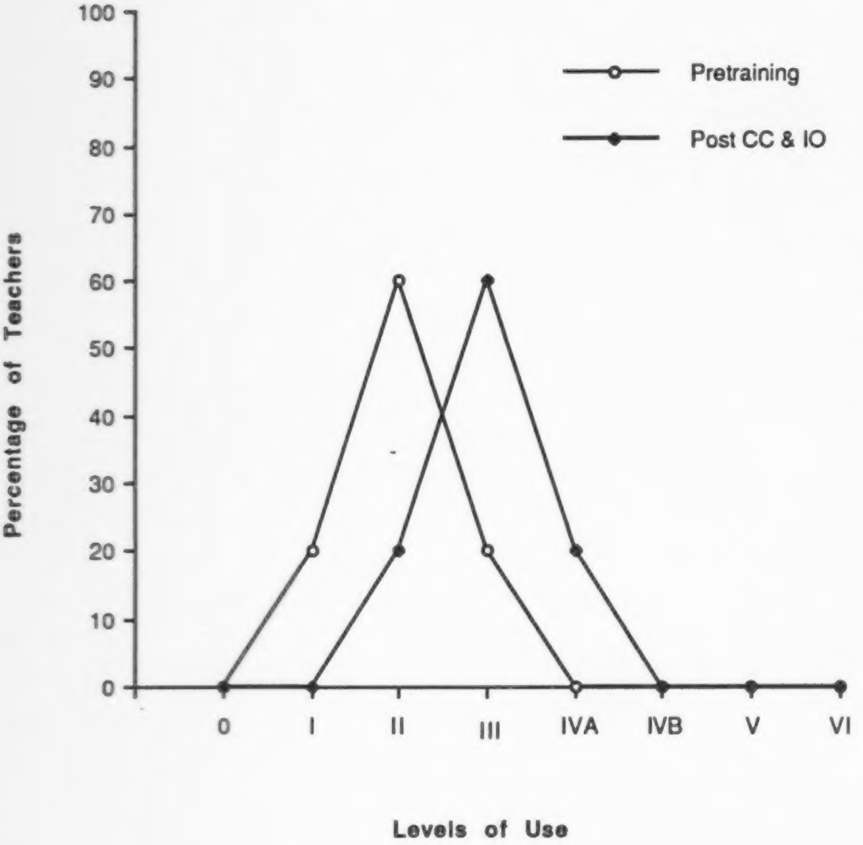


Figure 17. Percentage of Teachers at each Level of Use in Sch.103

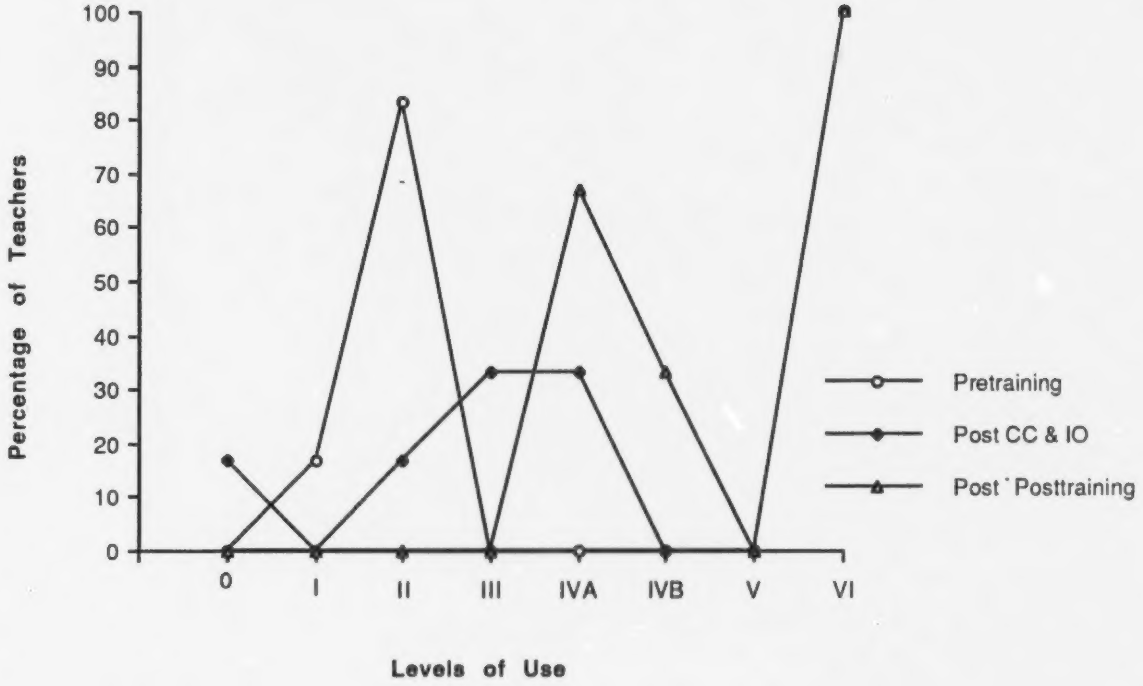


Figure 18. Percentage of Teachers at each Level of Use in Sch.201

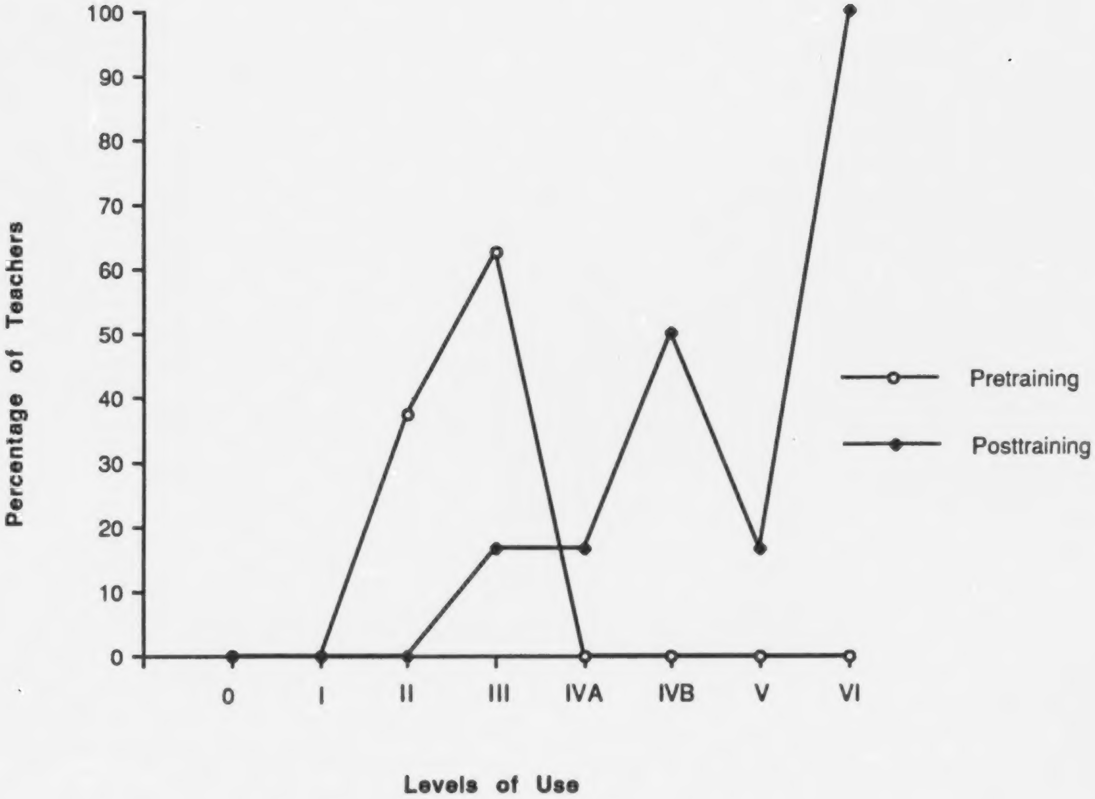


Figure 19. Percentage of Teachers at each Level of Use in Sch.202

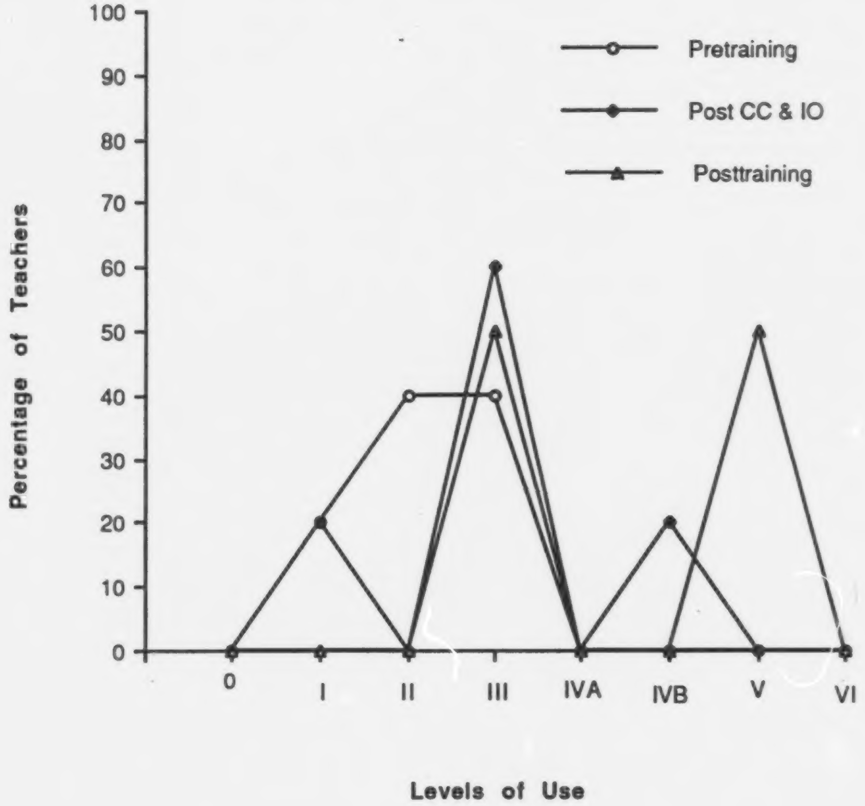


Figure 20. Percentage of Teachers at each Level of Use in Sch.203

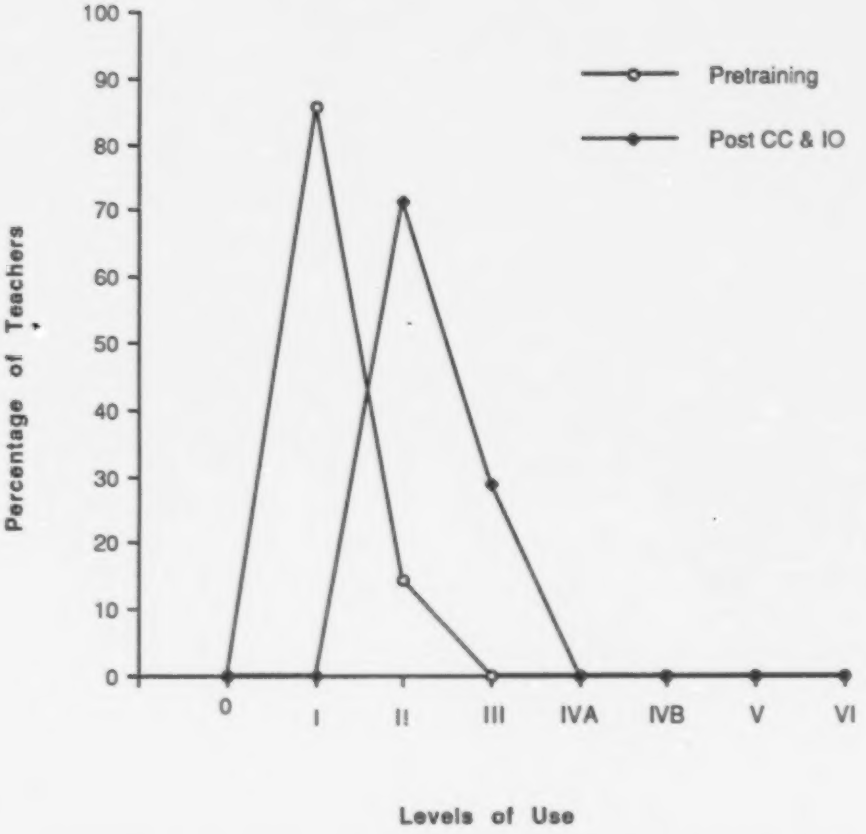


Figure 21. Percentage of Teachers at each Level of Use in Sch.302

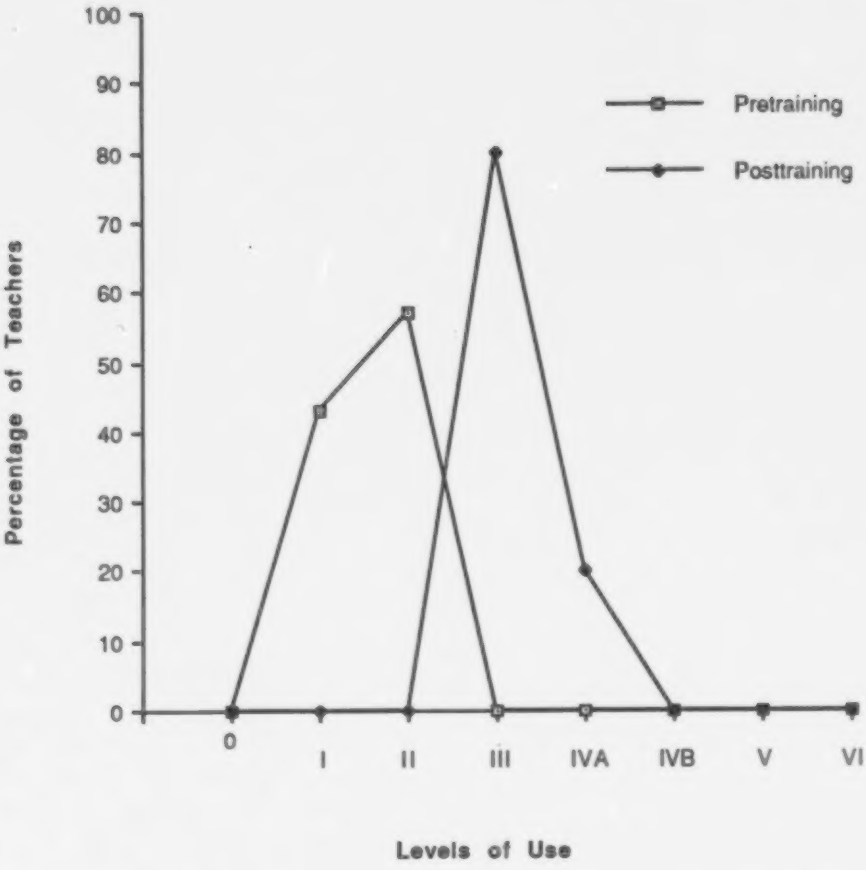


Figure 22. Percentage of Teachers at each Level of Use in Sch.303

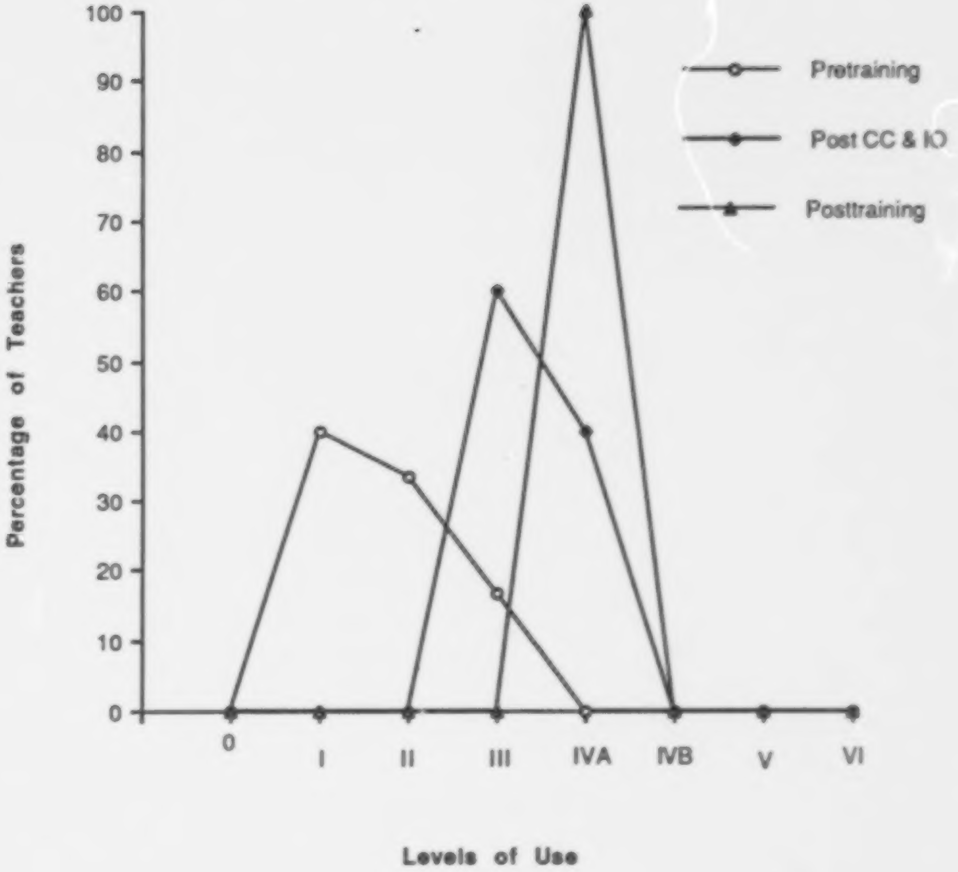


Figure 23. Percentage of Teachers at each Level of Use in Sch.401

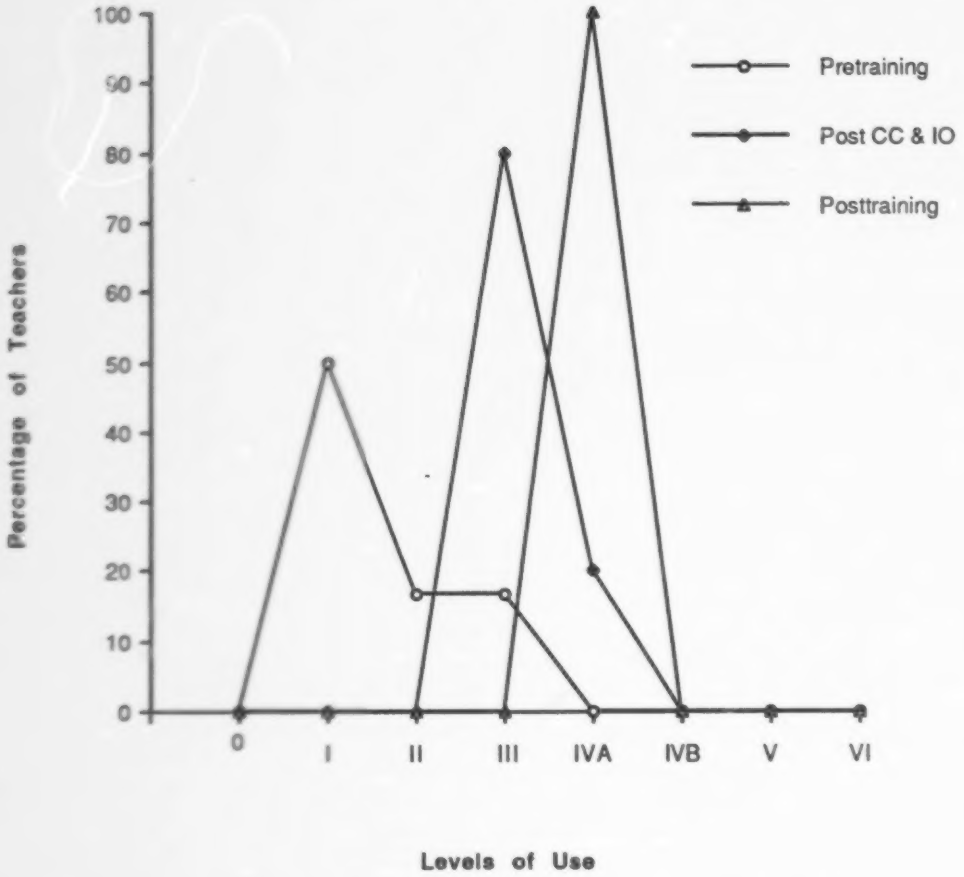


Figure 24. Percentage of Teachers at each Level of Use in Sch.402

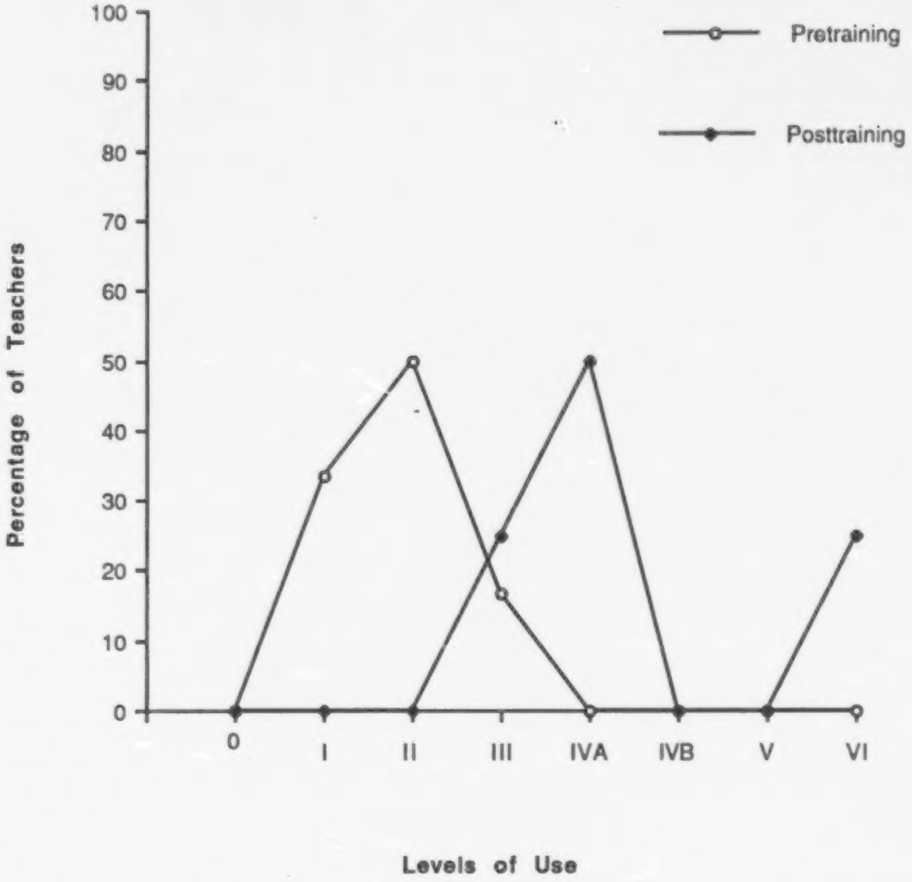


Figure 25. Percentage of Teachers at each Level of Use in Sch.403

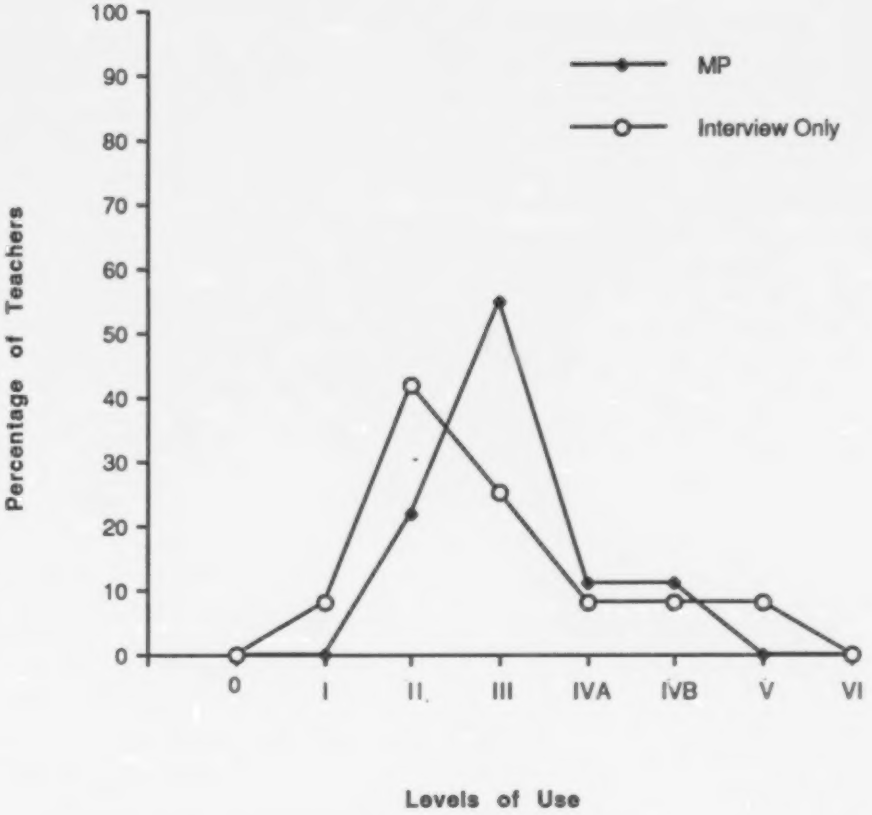


Figure 26. Comparison of teachers with and without MP training

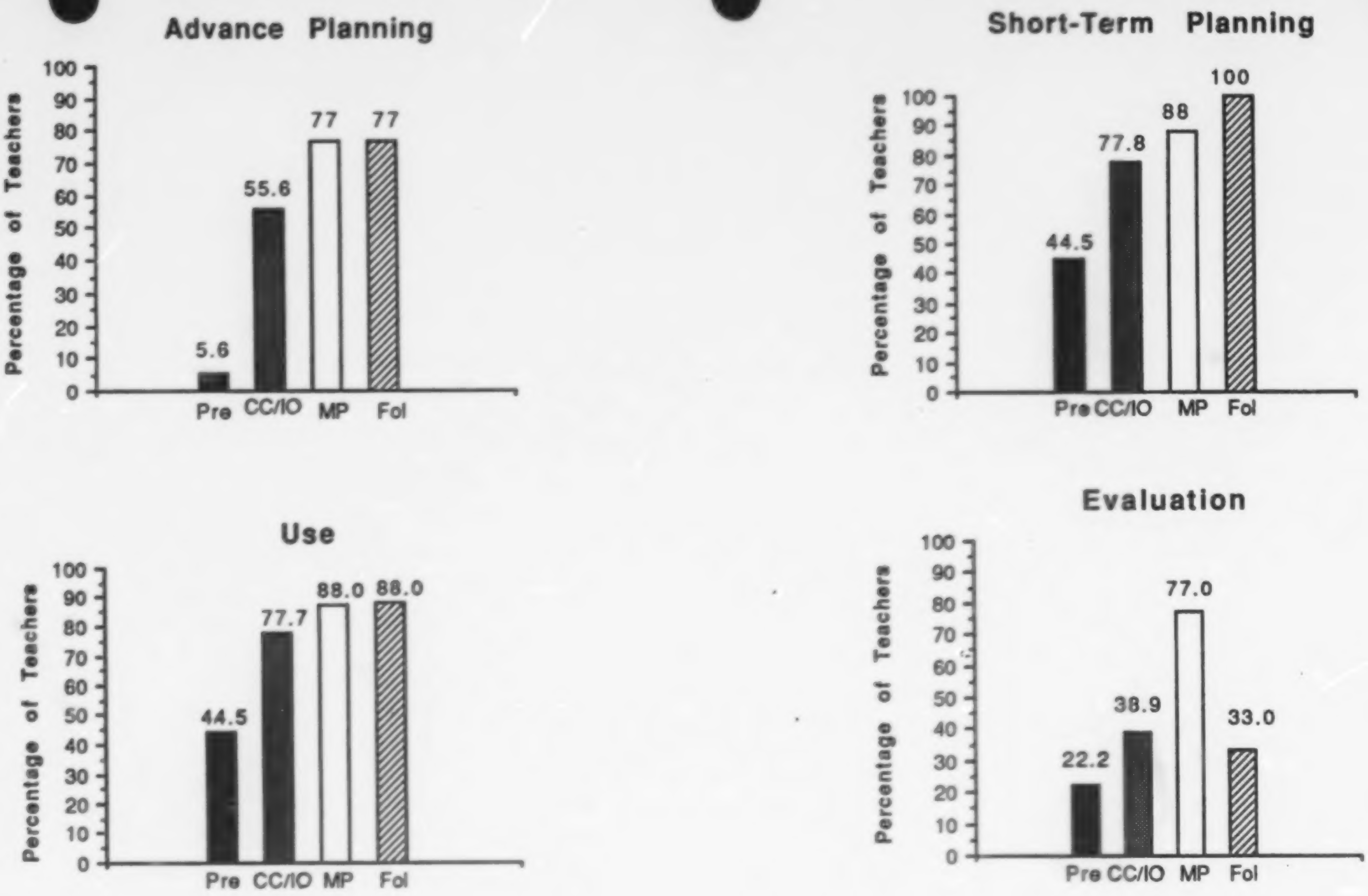


Figure 27. The Percentage of Teachers Implementing the Components of the Curriculum Correspondence Element.

■ Pretraining
■ Post CC & IO
☐ Post MP
▨ Follow-Up

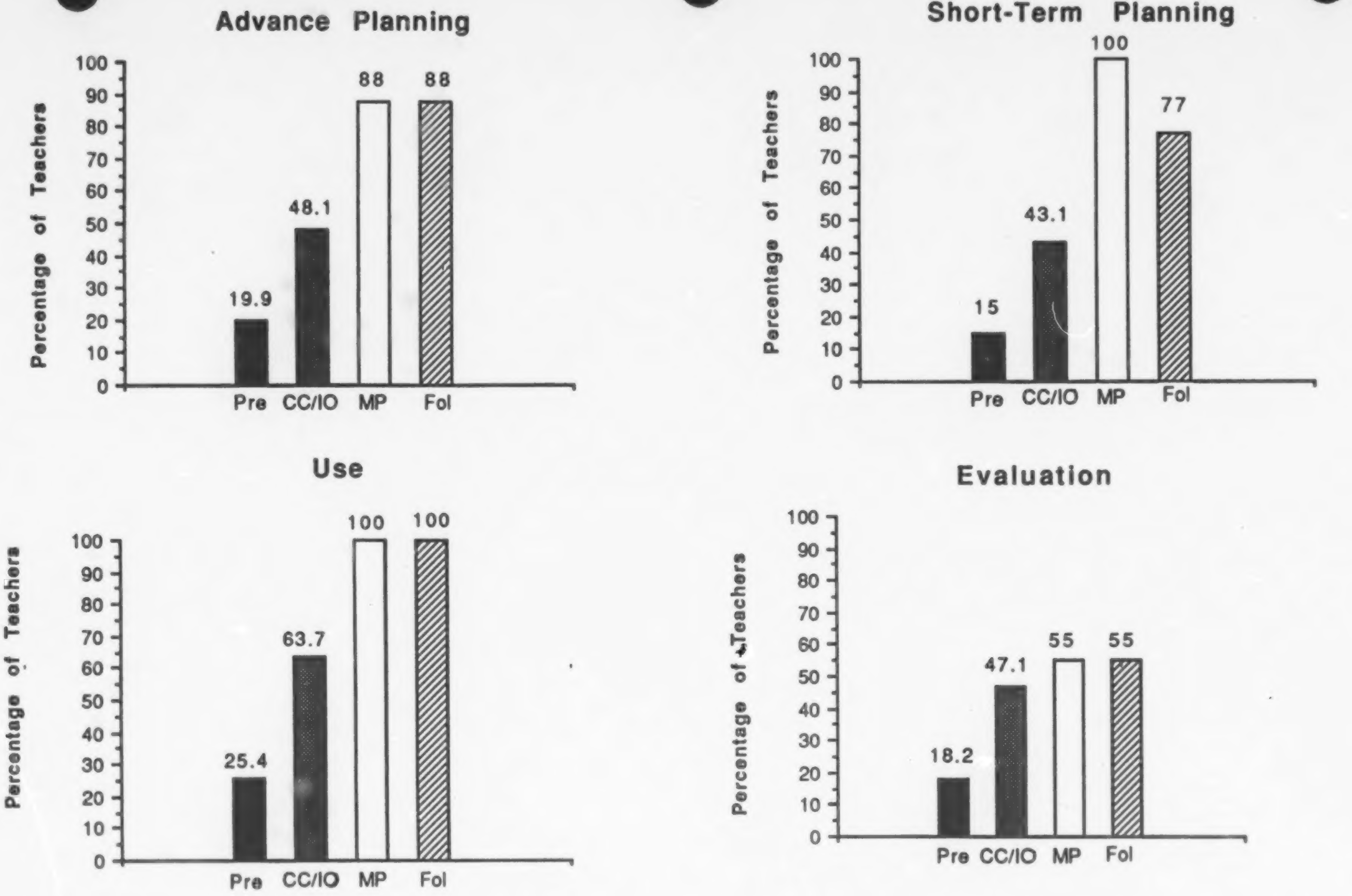


Figure 28. The Percentage of Teachers Implementing the Components of the Instructional Organizational Element

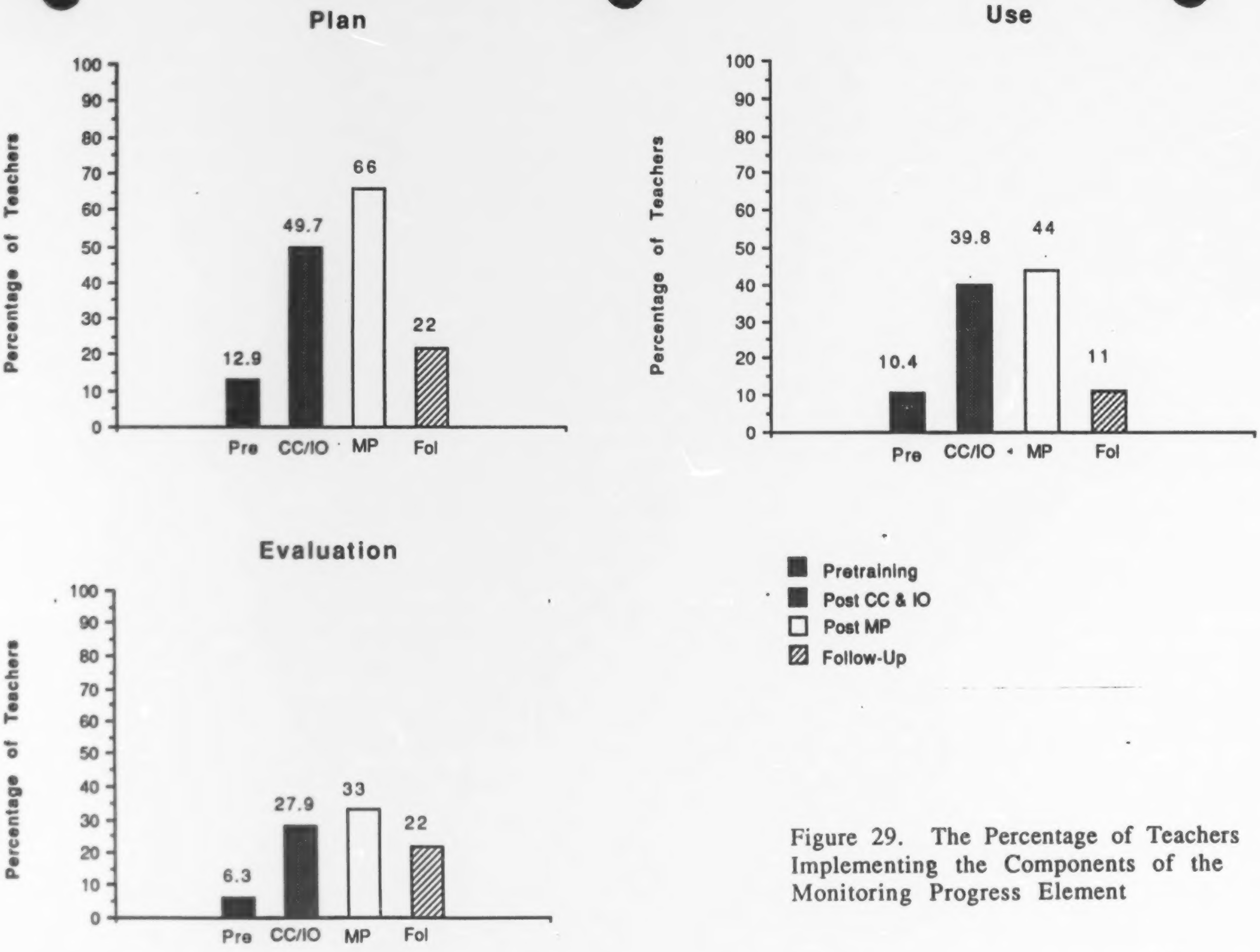


Figure 29. The Percentage of Teachers Implementing the Components of the Monitoring Progress Element

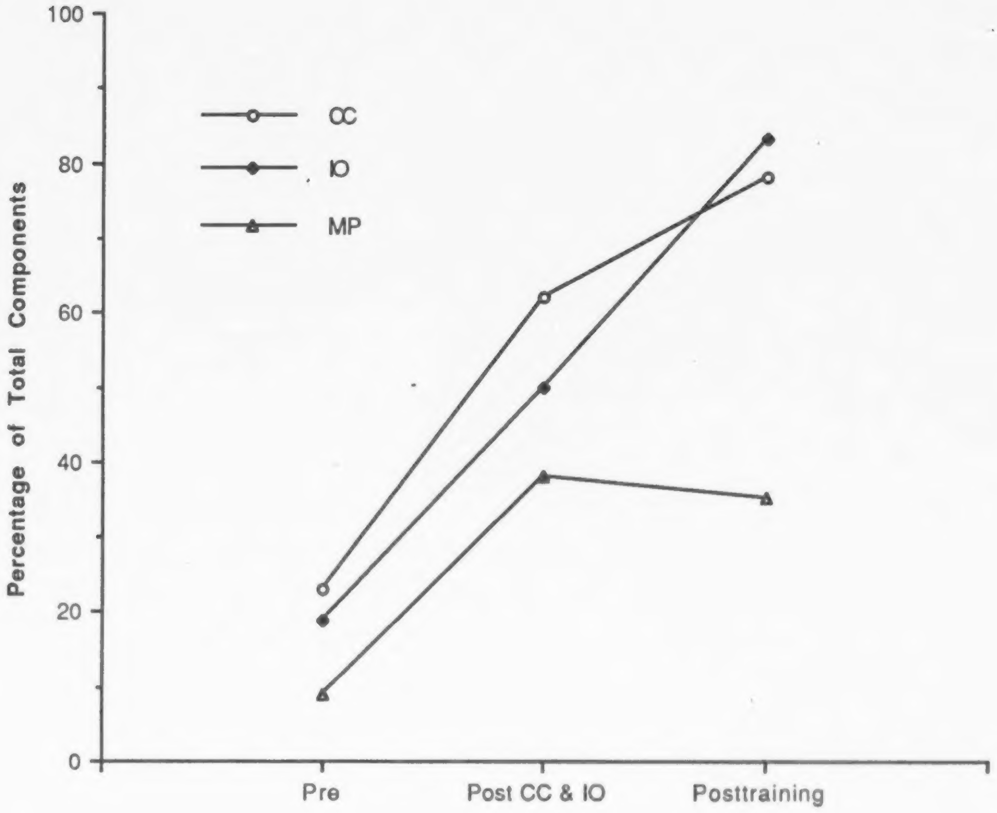


Figure 30. The Percentage of Total Components Implemented for Curriculum Correspondence (CC), Instructional Organization (IO), and Monitoring Progress (MP) at Three Assessment Points.

Fig. 31. Percentage Rated as Satisfactory in LEA 1.

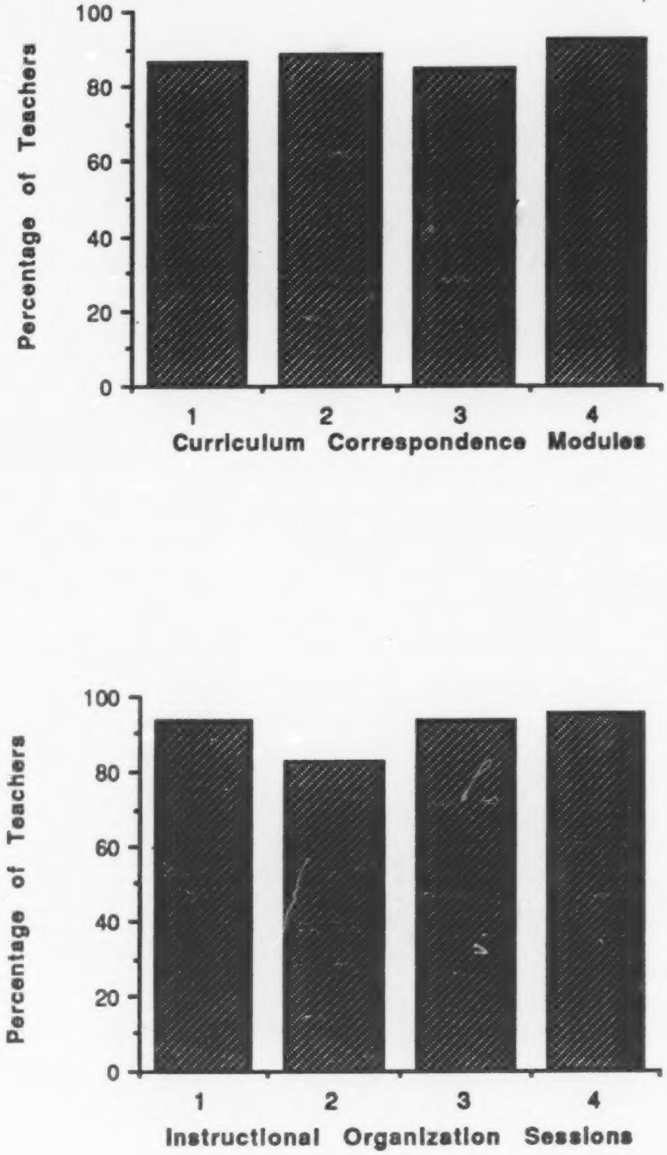


Fig. 32. Percentage Rated as Satisfactory in LEA 2.

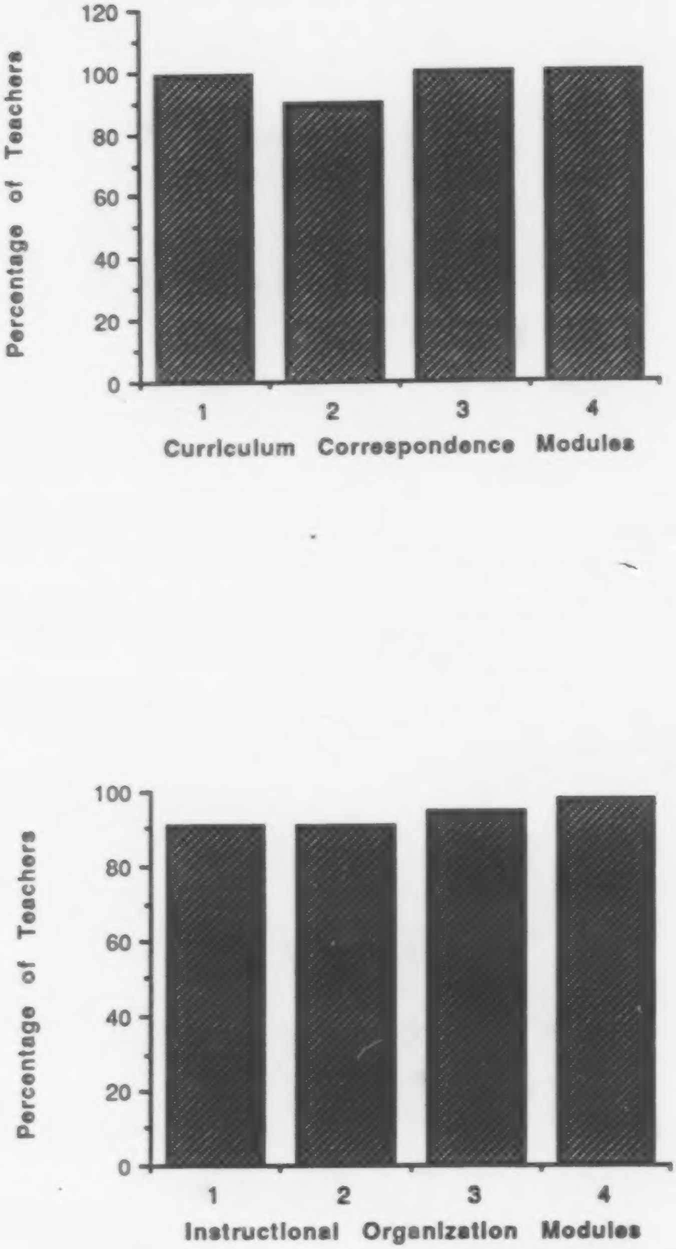
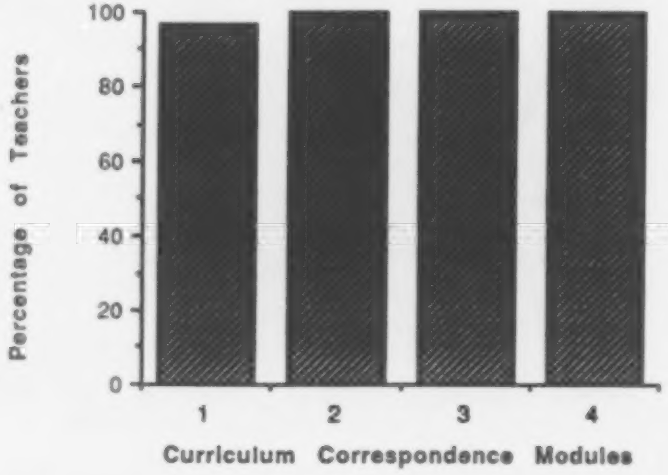


Fig. 33. Percentage Rated as Satisfactory in LEA 3.



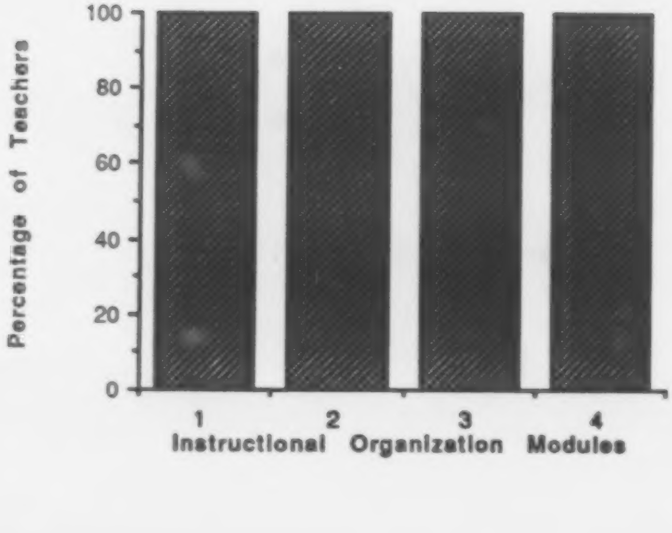
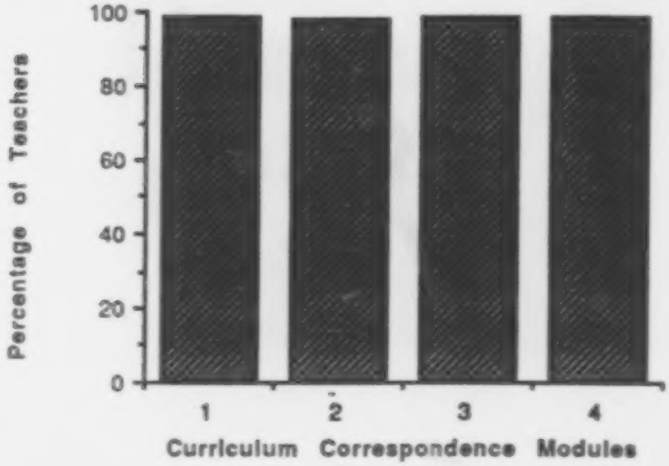
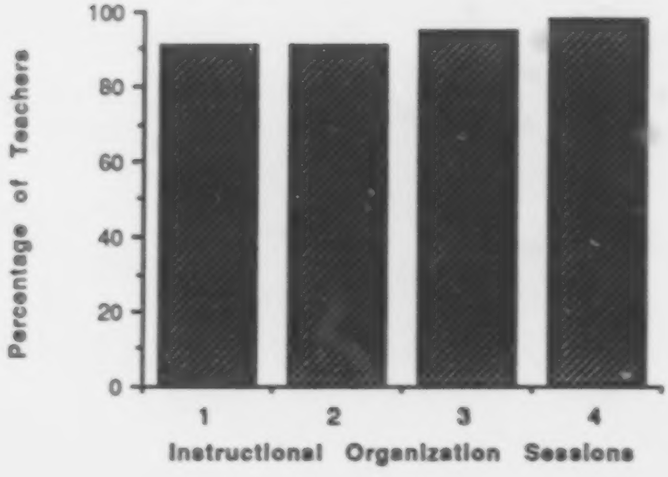


Fig. 34. Percentage Rated as Satisfactory in LEA 4.





FINAL REPORT - PART TWO

DISSEMINATION PLAN

The dissemination plan is designed to encourage awareness of, interest in, and ultimately use of the Technology Integration Project's (TIP) model and products. The first category, awareness and interest, targets activities which expose the individual to the innovation in the hope that the individual becomes interested in the new idea and seeks additional information about it. The second category, trial and use, highlights activities aimed at getting the individual to use the innovation in order to determine its utility in his or her own situation, and then, to adopt and fully implement the innovation. Additionally, a third category of activities is presented which seeks to stimulate the development of new initiatives which further the use and research of the TIP model.

As noted by MacArthur & Allen (1980) full dissemination culminates in the replication of effective practices and their adaptation to new settings. To stimulate such dissemination, TIP staff have (a) prepared materials and products for publication or other distribution and (b) designed a replication support system including materials, training, and consultation.

The Dissemination Plan is organized by the three major products: (a) the Technical Reports; (b) the Training Modules and Conceptual Framework and (c) the Final Report. The Plan identifies the prospective audiences for each product, the accomplishments to date, and the proposed actions to be achieved by September 30, 1991. It further specifies the type of assistance necessary for the consumers to be successful in using the information and the costs associated with securing it.

Part One: Awareness and Interest

1. Product: Technical Reports
   Form: Written reports
   Audience: Educational Researchers

Dissemination Vehicles	Accomplishments	Proposed Actions
CTHD Products Catalog	Products have been entered into database.	Product format is under development
ERIC/Silver Platter	Abstracts are being prepared.	
Quarterly Newsletter of TAP	Editorial roles are being assigned.	Work toward a summer '91 edition
LDA	Annual presentations have been made.	Submit proposal for '92
Professional Conferences	List circulated at CLD conference in Oct. 1989	
Advisory Committee	Reports given to members at annual meetings.	
Journal Articles	Journal of International Special Education, 1990. Journal of Special Technology, 1989.	Additional articles based on Final Report will be prepared.

Cost: Cost of copying and mailing reports.

2. Product: Training Modules and Conceptual Framework
   Form: Written Guides
   Audience: Administrators, Curriculum Coordinators, University Faculties

Dissemination	Accomplishments	Proposed Actions
TAM Back to School Guide		Submit info to Editor for Sept. 91 issue
Special Net	Bulletin Board Locations have been identified.	Forward information

Conference	CLD, Oct, 1989	CEC, Apr, 1992
Presentations	TAM, Jan, 1991	TAM, Jan, 1992
NASDSE's Counterpoint	Material is being prepared.	Phone contact and mailing will follow.
MSDE- Special Ed	Discussions with MSDE lead personnel	Continue discussions
CEC - Spec Ed Tech Ctr.	Material that will serve as the flyer content has been forwarded.	Will forward flyer itself when it has been completed
CTHD Products Catalog	The database for catalog has been created.	The actual format is being developed.
TAP/CTHD Newsletter	Editorial responsibilities are being established for a summer 1991 issue.	TIP/TIE description is being written.
LINC News	The content of the flyer has been forwarded.	Followup phone call
IBM	Negotiations are underway to incorporate TIE into the IBM TLC materials.	Negotiations will continue and content of the flyer will be forwarded.
Apple	Glenn Fisher and Alan Brightman have been identified as Apple people to contact.	Forward the content of the flyer.

Cost to consumer: No costs beyond those incurred in existing subscriptions, etc.

3. Product: Final Report
   Form: Written report
   Audience: Federal Government, Researchers, Evaluators, Technologists

Dissemination	Accomplishments	Proposed Actions
		Final report will be submitted by 9/30/91.

		Copies sent to the four participating school districts in Maryland.
		Copies sent to Advisory Committee members.

Part Two: Trial and Use

1. Product: Training Manuals and Conceptual Framework
   Audience: School systems

Dissemination Vehicle	Accomplishments	Proposed Actions
	CTHD has established fee for service for TIE	
	MP met with Des Moines school system officials to secure approval of TIE training for spring 1991 Training initiated in spring '91	
	The Research for Better Schools Educational Laboratory has been contacted and their interest in a partnership has been solicited.	
	Federal Hill, a Baltimore city school, has been chosen as a replication site.	TIP training will be provided.

Assistance: TIP project staff work with Internal Change Facilitators

2. Product: Training Modules and Conceptual Framework

   Audience: IHE Faculty

Dissemination Vehicle	Accomplishments	Proposed Action
Project Retool (CEC)	Presentation , Feb. 1991	Provide material at May 91 meeting to faculty from 24 IHEs.
Masters Program in Spec Ed Technology at JHU	Grant application submitted Mar. 91	
Course in Special Education Technology at Drake University	Course held spring, 91	Material incorporated in course syllabus for use each spring.

3. Product: Brochure for the Model
   Audience: IHE Faculty, LEA supervisors, SEA Department Heads, Intermediary service units

Dissemination Vehicle	Accomplishments	Proposed Action
Existing networks	The content has been developed	Format is being developed

Part Three: New Initiatives

Dissemination Vehicles	Accomplishments	Proposed Actions
Instructional Frameworks	Partnerships formed	Proposals will be developed
Support and Leadership Materials	37 Baltimore City Principals have been trained	Train 11 D.C. Administrators
The Abel Foundation	Negotiations are underway	Negotiations to continue
The Maryland Education Project	The format of the TIE Instruction modules was used to develop the Technology Applications in Mathematics Manuals	

Final Report

Part Three: Appendices

Appendix A: CBAM Instruments

Appendix B: Set 1 - Orientation Module

Appendix C: Set 2 - Curriculum Correspondence, Instructional Organization, and Monitoring Progress Modules

Appendix D: Set 3 - Support and Evaluation Modules
Teachers' Technology Resource Guide

Appendix E: Set 4 - Leadership Module and Principal's Assistant

Appendix A

Concerns Based Adoption Model Instruments

Introductory Page

Concerns Questionnaire

The purpose of this questionnaire is to determine what people who are using or thinking about using technology integration enhancement (TIE) are concerned about at various times during the innovation adoption process. The items were developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years experience using them. Therefore, some of the questions may appear to have little or no relevance to you at this time. For the completely irrelevant items, please circle "O" on the scale. Other items will represent those concerns you do have, in various degrees of intensity, and should be marked higher on the scale.

For example:

This statement is very true of me at this time.	0	1	2	3	4	5	6	[✓ 7]
This statement is somewhat true of me now.	0	1	2	3	[✓ 4]	5	6	7
This statement is not at all true of me at this time.	0	[✓ 1]	2	3	4	5	6	7
This statement seems irrelevant to me.	[✓ 0]	1	2	3	4	5	6	7

Please respond to the items in terms of your present concerns, or how you feel about your involvement, or potential involvement with TIE. We do not hold to any one definition of this innovation, so please think of it in terms of your own perception of what it involves. Since this questionnaire is used for a variety of innovations, the name TIE never appears. However, phrases such as "the innovation", "this approach", or "the new system" all refer to TIE. Remember to respond to each item in terms of your present concerns about your involvement or potential with TIE.

Thank you for taking the time to complete this task.

SoC Questionnaire Items

0	1 2	3 4 5	6 7
Irrelevant	Not true of me now	Somewhat true of me now	Very true of me now

1. I am concerned about students' attitudes toward this innovation. 0 1 2 3 4 5 6 7

2. I now know of some other approaches that might work better. 0 1 2 3 4 5 6 7

3. I don't even know what the innovation is. 0 1 2 3 4 5 6 7

4. I am concerned about not having enough time to organize myself each day. 0 1 2 3 4 5 6 7

5. I would like to help other faculty in their use of the innovation. 0 1 2 3 4 5 6 7

6. I have a very limited knowledge about the innovation. 0 1 2 3 4 5 6 7

7. I would like to know the effect of reorganization on my professional status. 0 1 2 3 4 5 6 7

8. I am concerned about conflict between my interests and my responsibilities. 0 1 2 3 4 5 6 7

9. I am concerned about revising my use of the innovation. 0 1 2 3 4 5 6 7

10. I would like to develop working relationships with both our faculty and outside faculty using this innovation. 0 1 2 3 4 5 6 7

11. I am concerned about how the innovation affects students. 0 1 2 3 4 5 6 7

12. I am not concerned about this innovation. 0 1 2 3 4 5 6 7

13. I would like to know who will make the decisions in the new system. 0 1 2 3 4 5 6 7

14. I would like to discuss the possibility of using the innovation. 0 1 2 3 4 5 6 7

15. I would like to know what resources are available if we decide to adopt this innovation. 0 1 2 3 4 5 6 7

16. I am concerned about my inability to manage all that the innovation requires. 0 1 2 3 4 5 6 7

17. I would like to know how my teaching or administration is supposed to change. 0 1 2 3 4 5 6 7

18. I would like to familiarize other departments or persons with the progress of this new approach. 0 1 2 3 4 5 6 7

0	**1 2**	**3 4 5**	**6 7**
Irrelevant	Not true of me now	Somewhat true of me now	Very true of me now

19.	I am concerned about evaluating my impact on students.	0 1 2 3 4 5 6 7
20.	I would like to revise the innovation's instructional approach.	0 1 2 3 4 5 6 7
21.	I am completely occupied with other things.	0 1 2 3 4 5 6 7
22.	I would like to modify our use of the innovation based on the experiences of our students.	0 1 2 3 4 5 6 7
23.	Although I don't know about this innovation, I am concerned about things in the area.	0 1 2 3 4 5 6 7
24.	I would like to excite my students about their part in this approach.	0 1 2 3 4 5 6 7
25.	I am concerned about time spent working with nonacademic problems related to this innovation.	0 1 2 3 4 5 6 7
26.	I would like to know what the use of the innovation will require in the immediate future.	0 1 2 3 4 5 6 7
27.	I would like to coordinate my effort with others to maximize the innovation's effects.	0 1 2 3 4 5 6 7
28.	I would like to have more information on time and energy commitments required by this innovation.	0 1 2 3 4 5 6 7
29.	I would like to know what other faculty are doing in this area.	0 1 2 3 4 5 6 7
30.	At this time, I am not interested in learning about this innovation.	0 1 2 3 4 5 6 7
31.	I would like to determine how to supplement, enhance, or replace the innovation	0 1 2 3 4 5 6 7
32.	I would like to use feedback from students to change the program.	0 1 2 3 4 5 6 7
33.	I would like to know how my role will change when I am using the innovation.	0 1 2 3 4 5 6 7
34.	Coordination of tasks and people is taking too much of my time.	0 1 2 3 4 5 6 7
35.	I would like to know how this innovation is better than what we have now.	0 1 2 3 4 5 6 7

Levels of Use Interview

1. Are you integrating the use of computers for instruction in your classroom?
   (If answer is no, proceed to sheet A; if answer is yes, continue)

2. Please tell me how you integrate the use of computers.

3. Do you mention computers in your written lesson plans?

4. Do you mention any specific software programs by name? How do you make decisions about which software to use?

5. Do you group students for working at the computer?
   (If yes, say "Please explain how you make the decisions").

6. What kinds of assistance do you give the students:
   - a) before CAI
   - b) during CAI
   - c) after CAI?

7. What do you see as the strengths of the way you integrate the use of computers?

8. Do you see any weaknesses in the way you integrate them? Please explain.

   a) Have you made any attempt to do anything about the weaknesses?
   (Probe those they mention specifically)

9. Are you currently looking for further information about integrating computers into your classroom instruction?

   - a) What kind of information?
   - b) For what purposes?

10. Do you ever talk with others about integrating computers into instruction?
    (If yes, ask "What do you tell them?")

11. Have you considered any alternatives or different ways of integrating computers into your classroom instruction?

12. Are you doing any evaluating of the integration of computers into your classroom? Please explain any formal methods you use. What about informal methods?

13. Have you received any feedback from students that would affect the integration of computers in your instruction?
    (If yes, ask "What did you do with the information you received?")

14. Have you made any changes recently in how you integrate computers into your instruction?
    If answer is yes, ask
    - a) What were the changes?
    - b) Why did you make them?
    - c) How recently were the changes made?

    If answer is no, ask 14 d) Are you considering making any changes?
    (If yes, ask why and what are the proposed changes?)

15a). Do you work with others in integrating computers into your instruction? (If answer is no, ask questions 22 and 23, if answer is yes, continue)

15b). Do you meet on a regular basis?

15c). Have you made any changes in your integration of computers into your instruction based on this coordination?

16. Please describe for me how you work together. (What things do you share with each other?)

17. What do you see as the effects of this coordination?

18. Are you looking for any particular kind of information in relation to this working together?

19. Do you talk with others about working together? If so, what do you share with them?

20. Have you done any formal or informal evaluation of how your talking with others is working?

21. What plans do you have for this effort in the future?

22. As you look ahead what plans do you have in relation to the integration of computers into your classroom instruction?

23. Do you have any concerns about integrating computers into your classroom integration?

Sheet A
(Levels of Use Interview)

1. Have you ever tried integration of computers into your instruction in the past?
   If the answer is no, skip to question 2.
   If the answer is yes, continue:
   a) When did you try integration?
   b) Why did you stop?
   c) How did you organize the integration?
   d) Did you find any problems, and if so what were they?
   e) What were the effects on the student?
   f) When you assess integration what do you see as the strengths?
   g) Do you see any weaknesses?

2. Have you made a decision to integrate computers into your classroom instruction in the future? If yes, when?

3. Can you describe the integration of computers into classroom instruction as you see it?

4. Are you currently looking for any information about integrating computers into your instruction?
   If the answer is yes, ask :
   a) What kinds of information?
   b) For what purpose?

5. What do you see as the strengths of computer integration in your situation?

6. Do you see any weaknesses? If so, what are they?

7. At this point in time, what kinds of questions are you asking about integration of computers into classroom instruction? (Give examples as necessary, such as: Now that the students are comfortable with the computers, do I really have to stay involved? Can't they just work on their own now?)

8. Do you ever talk with others and share information about integrating computers into classroom instruction? What do you share?

9. Can you tell me about any preparation or plans you have been making for integrating computers into your classroom instruction?

10. Can you summarize for me where you see yourself right now in relation to the integration of computers into your instruction?

Levels of Use of the Innovation

Level 0—Non-use
State in which the individual has little or no knowledge of the innovation, no involvement with it, and is doing nothing toward beaconing involved.

Decision Point A—Takes action to learn more detailed information about the innovation.

Level I—Orientation
State in which the individual has acquired or is acquiring information about the innovation and/or has explored its value orientation and what it will require.

Decision Point B—Makes a decision to use the innovation by establishing a time to begin.

Level II—Preparation
State in which the user is preparing for first use of the innovation.

Decision Point C—Begins first use of the innovation.

Level III—Mechanical Use
State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than needs of students and others. The user is primarily engaged in an attempt to master tasks required to use the innovation. These attempts often result in disjointed and superficial use.

Decision Point D-1—A routine pattern of use is established.

Level IVA —Routine
Use of the innovation is stabilized. Few, if any, changes are being made in ongoing use. Little preparation or thought is being given to improve innovation use or its consequences.

Decision Point D-2—Changes use of the innovation based on format or informal evaluation in order to increase client outcomes.

Level IVB—Refinement
State in which the user varies the use of the innovation to increase the impact on students within their immediate sphere of influence. Variations in use are based on knowledge of both short and long-term consequences for students.

Decision Point E —Initiates changes in use of the innovation based on input from and in coordination with colleagues for benefit of clients.

Levels of Use of Innovation (cont.)

Level V—Integration
State in which the user is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.

Decision Point F—Begins exploring alternatives to or major modifications of the innovation presently in use.

Level VI—Renewal
State in which the user reevaluates the quality of use of the innovation, seeks major modifications of, or alternatives to, present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the organization.

Innovation Configuration Components
Classroom Level TIE Strategies

Teacher ______________ Date ______________ Rater ______________

Curriculum Correspondence Configuration Checklist

Component 1: Advance Planning				
1. Writes lesson plans naming content specific software which matches. IEP	2. Writes lesson plans indicating use of content specific software.	3. Writes lesson plans which indicate use of CAI but does not name specific software.	4. Uses computer as tool but does not include in written lesson plans.	5. Does not plan use of computer as instructional tool.
Component 2: Short-term planning (Software Selection)				
1. Previews, selects and/or modifies software with correspondence to meet student curriculum and skill objectives as written in IEP.	2. Previews and selects software described as being in the relevant grade range content.	3. Selects software with no correspondence to curriculum.	4. Does not preview software.	
Component 3: Use of Appropriate Software to Enhance Student Learning				
1. Uses software which matches student's curriculum and skill level objectives as written in IEP.	2. Uses software selected for relevant grade level or content correspondence.	3. Uses any available software without regard to correspondence.	4. Does not use software as an instructional tool.	
Component 4: Evaluation of Curriculum Correspondent Software for future planning				
1. Records students' progress with curriculum congruent software at each session and uses data for future planning.	2. Records student progress on CAI regularly,but not at each use,and uses for future planning.	3. Evaluates use of CAI, but does not use data for future planning.	4. Does not evaluate the use of CAI.	

⁝ To left of slashed line: Full implementation of the component

Between slashed and solid lines: Partial implementation of the component

| To right of solid line:Lack of implementation of the component

Innovation Configuration Components
Classroom Level TIE Strategies

Teacher ________ Date ________ Rater ________

Instructional Organization Configuration Checklist

Component 1: Planning 1. Writes plans to group students with similar instructional objectives in appropriate numbers (1,2, or 3) at the computer for learning activities, and posts long-term (weekly) computer schedule..	2. Plans to give teacher assistance in the form of verbal, visual or tactile directions.	3. Plans to group students at the computer according to similarity of needs and instructional objectives.	4. Does not plan to group students nor to offer any assistance during CAI
Component 2: Advance Organizers 1. Gives appropriate verbal directions, has available visible instructions to students, and discusses grouping arrangements prior to CAI activities.	2. Gives some verbal directions or other assistance to students prior to their participation in a CAI activity.	3. Groups students at the computer before CAI according to their instructional needs and objectives.	4. Does not group students nor give any assistance prior to CAI
Component 3: Use 1. Groups students at computers in appropriate groups (1, 2 or 3 students), and gives verbal, visual or tactile help to students whenever necessary during computer activities.	2. Students are not grouped for CAI according to needs, but teacher gives assistance when needed.	3. Students work in groups of 1,2 or 3 students according to similarity of needs and instructional objectives.	4. Does not group students nor give assistance during CAI.
Component 4: Evaluation 1. Consistently evaluates students' progress during and at the end of each computer session.	2. Checks on students' progress on CAI at the end of each use.	3. Checks on students progress on CAI periodically.	4. Does not monitor students' progress during or after CAI activities.

⋮ To left of slashed line: Full implementation of the component

Between slashed and solid lines: Partial implementation of the component

│ To right of solid line: Lack of implementation of the component

Figure 4b
Innovation Configuration Components
Classroom Level TIE Strategies

Teacher ______________ Date ____________________ Rater ______________________

Monitoring Progress Configuration Checklist

Component 1: Planning 1. Plans for using software include both teacher and students collecting performance information.	2. Plans for student use of software with performance recording features.	3. Plans to use software with performance recording features for own benefit.	4. Does not plan to use software programs with performance recording features.
Component 2: Use 1. Uses performance record keeping features of CAI for measuring student progress and students also use for self-monitoring.	2. Teacher uses performance record keeping features for measuring student progress.	3. Students use record keeping features for self-monitoring.	4. Computer is not used for monitoring progress.
Component 3: Evaluation 1. Uses performance features of CAI for measuring student progress, and students chart or collect performance records from CAI.	2. Requires CAI assignments and record performance as part of summative evaluation for grades.	3. Uses performance recording features of CAI for evaluating student progress and help in future planning.	4. Does not use computer to evaluate student progress, and students do not use computers to monitor their own progress.

⋮ To left of slashed line: Full implementation of the component

Between slashed and solid lines: Partial implementation of the component

| To right of solid line is acceptable variation: Lack of implementation of the component

Appendix B

Set 1 - Orientation Module

SET-1
ORIENTATION MODULE

SET-1

ORIENTATION MODULE

Orientation to the Technology Integration Enhancement Model

INTRODUCTION: This module is intended to help workshop participants to understand the Technology Integration Enhancement Model's conceptual framework and the underlying rationale for the modules relating to the integration of appropriate software programs or tools with daily instruction to meet the learning needs of students. The module is composed of Instructor Notes, with:

(A) Participant Handouts
(B) Transparencies
(C) A Workshop Evaluation Form

TIME REQUIRED: 60 minutes

TARGET AUDIENCE: Building administrators, support personnel, special and regular education teachers of students with mild handicaps.

BEST COPY AVAILABLE

Instructor Notes

TIE
Orientation

SHOW: Transparency 1. *Participant Survey*

REFER TO: Handout 1.

Handout
O - 1

Introduction: This module constitutes **Set 1** of the material which provides an overview of, and the underlying rationale for, the Conceptual Framework of the Technology Integration Enhancement model (TIE) for using computers in the classroom as an integrated part of daily instruction. The integration of technology into regular instruction is based upon already existing sound instructional practices.

TIE
Orientation

SHOW: Transparency 2. Use progressive disclosure.

OBJECTIVES

- ***To describe the organizing ideas that define the TIE Conceptual Framework.***
- ***To identify the three components of the Conceptual Framework: Instruction, Support and Leadership.***
- ***To identify the three Technology Integration Principles of Instruction.***
- ***To describe the Twelve Essentials for the Integration of Technology into Instruction.***
- ***To discuss the Twelve Facilitation Support Strategies of TIE.***
- ***To describe the Essentials of Planning in the Leadership Component of TIE.***
- ***To discuss the procedures for the evaluation strategies of TIE.***

READ: The integration of technology requires that the use of computers and computer software promote the existing curriculum objectives. This requirement is the basis for the curriculum correspondence technology integration principle. The integration of computers requires that the use of computers be an integral aspect of classroom instruction. The second requirement is the basis of the second technology integration principle that addresses instructional organization. The requirement that the consistent monitoring of student progress be supported by technology is the third technology integration principle. These three principles are reviewed later.

TIE
Orientation

SHOW: Transparency 3.

OBJECTIVE

To describe the organizing ideas that define the TIE Conceptual Framework.

READ: The TIE Model is **a)** organizing ideas that are outlined in the TIE Conceptual Framework, and **b)** sets of materials that operationalize those ideas and serve to implement and evaluate the use of the Model. These sets of materials are organized as follows:

SET 1: The Orientation Module as an overview to the TIE model and the three Components of its Conceptual Framework.

SET 2: Materials relating to: **Instruction**

SET 3: Materials relating to: **Support**

SET 4: Materials relating to: **Leadership**

DISCUSS: One source of the organizing ideas of the TIE Model is a systems analysis framework with four realms. Some discussion of these realms is preliminary to a discussion of the TIE Conceptual Framework.

TIE
Orientation

SHOW: Transparency 4.

A Systems Analysis Conceptual Framework For Technology Integration

Handout
O - 2

READ: There must be on-going communication between all four realms in the Systems Analysis.

DISCUSS: (Discussion of Four Realms)

(1) Administrative Realm- Administrative support, both at the building level and at the district level, is essential for the integration of technology. Administrative support means leadership and related goals, objectives, and strategies which empower teachers and learners. It means actions which help create professional work environments, and which give tangible resources to classroom level activities, and to teachers and learners.

(2) Resource Allocation Realm- Just as any other mechanism for change cannot act in isolation, the integration of technology into the classroom for children with mild disabilities will not be accomplished without support from building level administrators and key personnel. Many schools depend on the school principal as the chief decision-maker, but others have a committee or a computer resource person charged with deciding what hardware/software to purchase, where to locate the computers, and how to schedule computer assisted instruction (CAI). TIE requires a baseline of necessary resources for accomplishing the integration of technology for instruction in the elementary school.

Hardware- It is recommended that a special education resource room should possess at least one permanently resident computer, whereas integration may be achieved in a regular education elementary school classroom which has access to .5 microcomputers daily. These computers should have at least 64 Kilobytes of memory.

Software- Critical curriculum units must be appropriately addressed by available software. Teachers have a strong sense of curriculum relative to the instructional needs of their students, but without training they may not be able to apply this curriculum correspondence to software selection. Strategies for software selection will be presented in Module #2.

(3) Teacher Development Realm- Despite the increased availability of computers in the schools, the anticipated benefits of the technology often are not being realized. A report from the Office of Technology Assessment, U.S. Congress, (Power On! 1988), finds that investments in technology cannot be fully effective unless teachers receive training and support. A major aspect of the current drive to improve American education is the focus on raising professional teaching standards and giving teachers greater responsibility and autonomy.

Technology could be an important lever for change. Yet the vast majority of teachers, or those intending to teach, have had little or no training in the use of computers in the classroom. In-service training in technology has unique requirements that distinguish it from traditional in-service activities. Teachers need a well-equipped facility, an environment that allows them to explore the technology, and time to master the software which will enhance the skills of their students. In addition, instructors for these activities must appreciate teachers' special concerns, and must often overcome "technology anxiety". If computer technology is to "have an impact on teaching and learning, teachers must be comfortable with computers, seeing them as tools that enhance, rather than interfere with, their daily teaching. For this to happen, teachers need special training" (Power On!, 1988 p. 98).

In spite of many course offerings in teacher preparation institutions, many graduates do not feel prepared to use computers in teaching. The courses offered are more often geared to learning about technology than in learning how to use the technology in the classroom. The TIE model, based on principles of "best practices in education", will train teachers to integrate computer assisted instruction into their curriculum.

(4) Instructional Delivery Realm-Effective Instruction
Effective schools are characterized as having systematic and consistent procedures for monitoring and assessing student progress. Teachers make educational decisions of what, when, and how to teach according to the demands of the curriculum and the characteristics of the students. These characteristics include current competency levels in each area of the curriculum as well as abilities and potential for progressing. Systematic and consistent monitoring of student progress is necessary to determine current levels of student performance and progress toward instructional goals. Instruction should be planned according to a series of objectives set forth in the curriculum. The criterion of adequate performance should be stated so that it can be determined if the objective was accomplished. In order for technology to be effective, it is important to adhere to basic procedures for utilizing instructional objectives as a criterion for determining adequate learning. Researchers and teachers must share the responsibility for the development and implementation of such guiding principles. The Johns Hopkins Technology Integration Project has worked to develop such principles.

TIE
Orientation

SHOW: Transparency 5.

OBJECTIVE

To identify the three components of the Conceptual Framework: Instruction, Support and Leadership.

READ: The Conceptual Framework reflects how these realms work together towards student outcomes.

TIE
Orientation

SHOW: Transparency 6.

Components of the Conceptual Framework:

Instruction ***Support*** ***Leadership***

Handout
O - 3

ASK: What factors in the Instructional Delivery Realm are important for successful student outcomes?

DISCUSS STRATEGIES: Allow participants to devise their own list. After discussion ask if participants agree with research based components as follows:

The **Instructional** component with its three elements and twelve essentials informs teachers of ways to plan, deliver, and evaluate instruction. The three elements are: Curriculum Correspondence, Instructional Organization, and Monitoring Progress.

The **Support** component outlines strategies that facilitate and evaluate the efforts of teachers to implement the twelve essentials.

The **Leadership** component focuses on three interrelated clusters that define the essentials of planning. These clusters are Strategic Concepts that must be reflected in the process of planning, Tactical Steps (or objectives) that further define the plan, and specific Implementation Procedures that describe activities.

TIE
Orientation

SHOW: Transparency 7.

OBJECTIVE

To identify the Three Technology Integration principles of Instruction.

TIE
Orientation

SHOW: Transparency 8.

READ: Three principles based on sound instructional practices emerged during the research phase of the Technology Integration Project. These are:

- ***Computer-assisted instruction should correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum.***
- ***The use of the microcomputer should be an integral aspect of organizing students for instruction.***
- ***The consistent monitoring of student progress should be supported by technology.***

Description of Set 2:

Materials which relate to Component One of the Conceptual Framework: Instruction

TIE
Orientation

SHOW: Transparency 9.

OBJECTIVE

To describe of the Twelve Essentials for the Integration of Technology into Instruction.

READ: The instruction materials are modularized manuals that are used to provide specific staff development sessions for teachers. These modularized manuals include: Instructor's Notes, Handouts and Transparencies.

TIE
Orientation

Handout
O - 4

SHOW: Transparency 10.

The Twelve Essentials For the Integration of Technology Into Instruction.

- ***Curriculum Correspondence***
  1. ***Write Lesson Plans***
  2. ***Preview, Select, and/or Modify Software***
  3. ***Link Computer Activity***
  4. ***Group Students***
- ***Instructional Organization***
  5. ***Group Students***
  6. ***Post/share Schedule***
  7. ***Provide Clear Directions***
  8. ***Continuously Monitor Computer Activities***

(Continued Next Page.)

- ***Monitoring Progress***
  9. ***Continuously Monitor Student Progress***
  10. ***Record Student Progress***
  11. ***Use Performance Information***
  12. ***Instruct Students to Use Features of Software***

READ: These instruction materials focus on how teachers can make technology an integral aspect of students' instruction. **The twelve essentials** for the integration of technology into instruction are each associated with one of the three elements of instruction. These elements, as has been stated, are curriculum correspondence, instructional organization, and monitoring progress. Fundamental to the TIE conceptual framework is an understanding of the elements of sound instructional practices. Just as technology needs to be integrated into non-computer instruction, technology ideas need to be incorporated into ideas about instruction that may not yet reflect technology.

TIE
Orientation

SHOW: Transparency 11.

OBJECTIVE

To discuss the Twelve Facilitation Support Strategies of TIE.

TIE
Orientation

Handout
O - 5

SHOW: Transparency 12.

The Twelve Facilitation Support Strategies of TIE

1. ***Adding and linking resources.***
2. ***Helping teachers understand the possibilities.***
3. ***Providing specific staff development sessions.***
4. ***Consulting and collaborative problem solving.***
5. ***Organizing the technology.***
6. ***Giving solutions.***
7. ***Providing technical assistance.***
8. ***Providing models and demonstration.***
9. ***Energizing and motivating.***
10. ***Developing support structures.***
11. ***Supporting the teacher emotionally.***
12. ***Monitoring and evaluating.***

Description of Set 3:

Materials which relate to Component Two of the Conceptual Framework: Support

FORMAT: The Support materials are modularized manual that can be used to provide specific staff development sessions or serve as a tutorial. The materials are in a narrative format with masters. The masters can be used as handouts or overheads and the narrative can be easily transformed into comments to guide the discussion of the handouts and transparencies.

READ: The Support materials focus on how to help teachers actually incorporate **the twelve essentials** for the integration of technology into their repertoire. A review of the twelve essentials reveals that the demand on teachers is substantial. Teachers must receive support if they are going to successfully respond to this or any similar demand. Virtually every innovation or program development effort includes the provision of specific staff development sessions. However, typically much more is needed. Consulting and collaborative problem solving are particularly important.

THE TEACHERS' TECHNOLOGY RESOURCE GUIDE

FORMAT: The Teachers' Technology Resource Guide is a directory of resources that is divided into twelve sections as follows: Magazines and Newsletters, Associations and Journals, Magazines for Families, Software Review Catalogs, Software Curriculum Guides, Sources of Public Domain Software, On-Line Information Services, Networking, Users' Groups, Resource Centers, National Projects, and Funding Sources and Grants. Addresses and/or descriptions are provided.

READ: This guide supports teachers who are implementing TIE by providing brief descriptions of the kinds of resources listed above. Specific illustrations of the use of the guide are provided with the staff development sessions.

TIE
Orientation

SHOW: Transparency 13.

OBJECTIVE

To describe the Essentials of Planning in the Leadership Component of TIE

Description of Set 4:

Materials which relate to Component Three of the Conceptual Framework: Leadership

FORMAT: The Leadership materials are separate manuals:

1. A Staff Development Manual.
2. The Principal's Assistant

STAFF DEVELOPMENT MANUAL

FORMAT: The staff development materials are in a narrative format with masters. The masters can be used as handouts or transparencies and the narrative can be easily transformed into comments to guide the discussion of the handouts and transparencies. In addition, there is a literature review that develops the rationale for the approach to planning.

TIE
Orientation

Show: Transparency 14.

LEADERSHIP : ESSENTIALS OF PLANNING - CONCEPTS, STEPS and PROCEDURES.

- *Strategic Concepts*
- *Tactical Steps*
- *Implementation Procedures*

READ: This manual focuses on three interrelated clusters that define the essentials of planning. These clusters are **Strategic Concepts** that must be reflected in the process of planning, **Tactical Steps** (or objectives) that further define the plan, and specific **Implementation Procedures** that describe activities. Examples from previous staff development sessions and activity templates are provided to guide the provision of sessions.

THE PRINCIPAL'S ASSISTANT

FORMAT: Three Building Principal task areas (Communications Tasks, Instructional Tasks, and Management Tasks) are used to organize descriptions of software features and solutions. Specific tasks within these areas are listed with descriptions of application packages that can support those tasks. A comprehensive list of MS-DOS compatible products and lists of resource materials are also provided.

READ: The Principal's Assistant is a guide for the building administrator who is working to use computers to support three essential administrative task areas. The listings of features and product descriptions help principals explore and utilize various application packages.

TIE
Orientation

SHOW: Transparency 15.

OBJECTIVE

To discuss the procedures for the evaluation strategies of TIE.

FORMAT: The Evaluation materials can be used as a tutorial or to present a session. The materials are in a narrative format with masters. The masters can be used as handouts or overheads and the narrative can be easily transformed into comments to guide the discussion of the handouts or transparencies.

READ: These materials provide a description of the procedures needed to evaluate local efforts to implement the TIE model. Procedures used by the staff of the Technology Integration Project are described. Data are gathered through questionnaire, interview, observation and document procedures. These procedures are based on the Concerns Based Adoption Model (CBAM) and provide evidence of change in attitudes and use across time.

Handout
O - 6

EVALUATION

Conduct Evaluation - Workshop Session Ends

Introduction

Please Complete

Handout 1

Participant Survey

Thank you!

Participant Survey

TIE
Orientation
Module-O

Handout
O - 1

Name:____________________ District:____________________

Address:____________________ Telephone:____________________

School or Office:____________________ Grade Level:____________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:____________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1 2 3 4 5

(beginner) (competent/comfortable) (expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

   100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer? **YES** **NO**
3. Can you obtain further access by using a computer lab? **YES** **NO**
4. Do you know how to use many published software products? **YES** **NO**
5. Have you used a wide range of published software in your classroom? **YES** **NO**
6. Have you integrated many published software products into your:
   - weekly instructional plan? **YES** **NO**
   - daily lesson plan? **YES** **NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products? **YES** **NO**

Objectives

OBJECTIVES

- To describe the organizing ideas that define the TIE Conceptual Framework.
- To identify the three components of the Conceptual Framework: **Instruction**
  Support
  Leadership
- To identify the three Technology Integration Principles of Instruction.
- To describe the Twelve Essentials for the Integration of Technology into Instruction.
- To discuss the Twelve Facilitation Support Strategies of TIE.
- To describe the Essentials of Planning in the Leadership Component of TIE.
- To discuss the procedures for the evaluation strategies of TIE.

OBJECTIVE

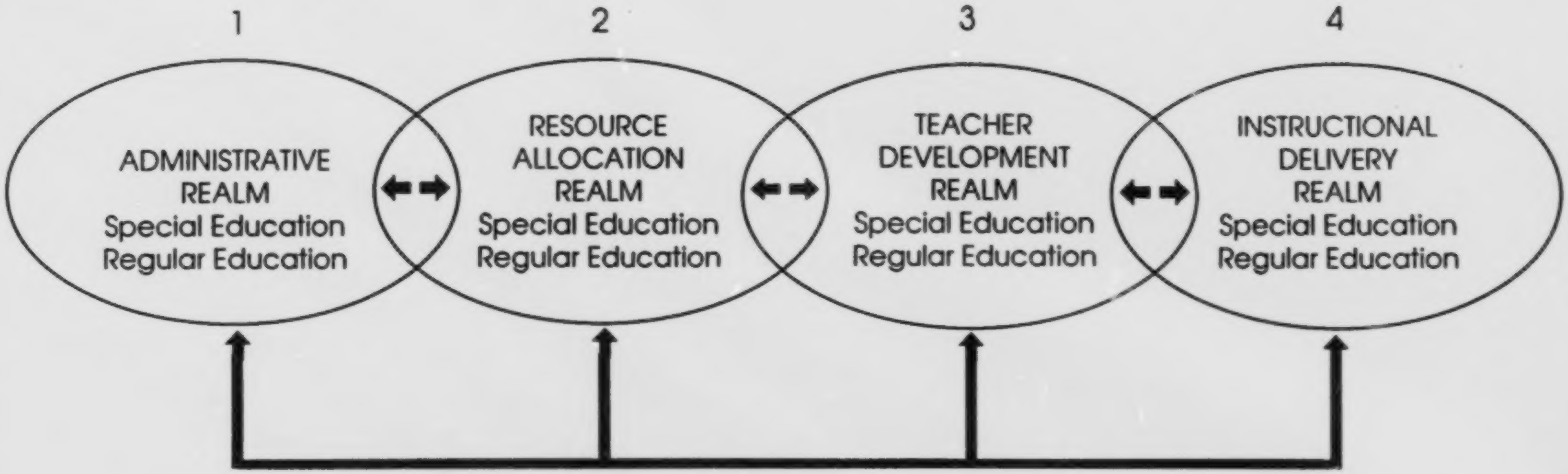
To describe the organizing ideas that define the TIE Conceptual Framework.

A SYSTEMS ANALYSIS CONCEPTUAL FRAMEWORK FOR TECHNOLOGY INTEGRATION

TIE
Orientation
Module-O
T-4

Handout
O - 2

A SYSTEMS ANALYSIS CONCEPTUAL FRAMEWORK FOR TECHNOLOGY INTEGRATION



1
ADMINISTRATIVE REALM
Special Education
Regular Education

2
RESOURCE ALLOCATION REALM
Special Education
Regular Education

3
TEACHER DEVELOPMENT REALM
Special Education
Regular Education

4
INSTRUCTIONAL DELIVERY REALM
Special Education
Regular Education

OBJECTIVE

To identify the three components of the Conceptual Framework: Instruction, Support and Leadership.

The TIE Conceptual Framework for Technology Integration

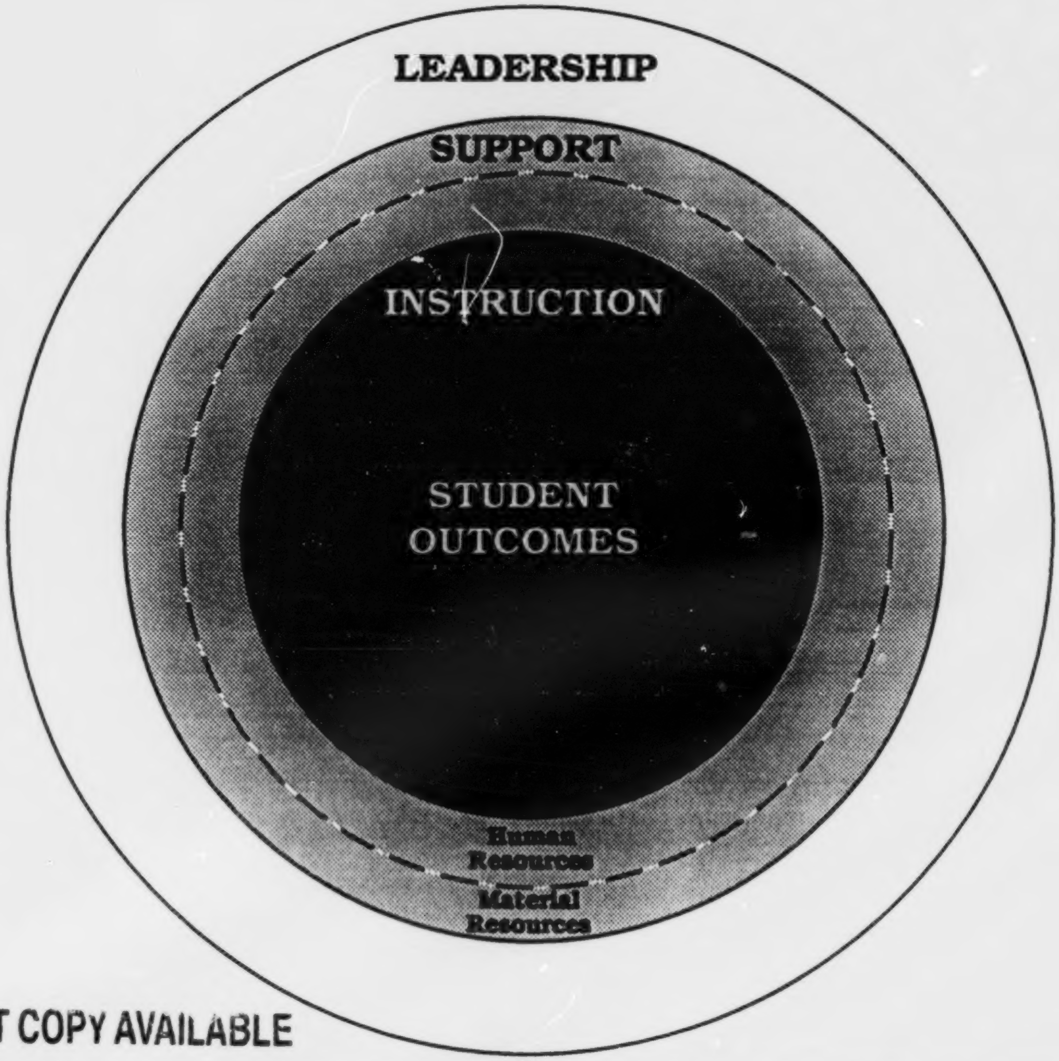
TIE
Orientation
Module-O
T-6

Handout
O - 3

INSTRUCTION
Essentials For the Delivery of Instruction

SUPPORT
Specific Facilitation Support Strategies

LEADERSHIP
Focus on Planning: Strategic Concepts, Tactical Steps, and Implementation Procedures


LEADERSHIP
SUPPORT
INSTRUCTION
STUDENT OUTCOMES
Human Resources
Material Resources

BEST COPY AVAILABLE

Objective

OBJECTIVE

To identify the three technology integration principles of instruction.

Technology Integration Principles

- Computer-assisted instruction should correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum.

- The use of the microcomputer should be an integral aspect of organizing students for instruction.

- The consistent monitoring of student progress should be supported by technology.

OBJECTIVE

To describe the
Twelve Essentials for the
Integration of Technology
into Instruction.

Handout
O - 4

The Twelve Essentials for the Integration of Technology into Instruction

CURRICULUM CORRESPONDENCE:

1. **Write lesson plans** naming specific software which matches student curriculum and skill objectives.
2. **Preview, select, and/or modify software** to meet student curriculum and skill objectives.
3. **Link computer activity** with regular instruction using examples and modeling.
4. **Group students** at the computer according to academic needs.

INSTRUCTIONAL ORGANIZATION:

5. **Group students** according to social and classroom factors.
6. **Post/share schedule** including time, group, and software to be used.
7. **Provide clear directions** (verbal and visual) for using the program.
8. **Continuously monitor computer activities** and student behavior in the classroom.

MONITORING PROGRESS:

9. **Continuously monitor student progress** while using software.
10. **Record student progress** at each session.
11. **Use performance information** for future lesson planning.
12. **Instruct students to use features of software** to self-monitor performance.

OBJECTIVE

To discuss the Twelve Facilitation Support Strategies of TIE.

Handout
O - 5

The Twelve Facilitation Support Strategies for Technology Integration

1. Adding and linking resources.
2. Helping teachers understand the possibilities.
3. Providing specific staff development sessions.
4. Consulting and collaborative problem solving.
5. Organizing the technology.
6. Giving solutions.
7. Providing technical assistance.
8. Providing models and demonstration.
9. Energizing and motivating.
10. Developing support structures.
11. Supporting the teacher emotionally.
12. Monitoring and evaluating.

OBJECTIVE

To describe the Essentials of Planning in the Leadership Component of TIE.

LEADERSHIP: Essentials of Planning - Concepts, Steps, and Procedures

- Strategic Concepts
- Tactical Steps
- Implementation Procedures

OBJECTIVE

To discuss the procedures for the evaluation strategies of TIE.

Workshop Evaluation

TIE
Orientation
Module-O

Handout
O - 6

Title of Module (Session): ____________________

Location: ____________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by____________________ I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent **1** **2** **3** **4** **5** **Poor**

2. The objectives of the module were:

Clearly Evident **1** **2** **3** **4** **5** **Vague**

3. The ideas and activities presented were:

Interesting **1** **2** **3** **4** **5** **Dull**

4. The scope (coverage) of the topic was:

Adequate **1** **2** **3** **4** **5** **Inadequate**

5. The presentation was:

Excellent **1** **2** **3** **4** **5** **Poor**

6. My attendance at this workshop should prove:

Beneficial **1** **2** **3** **4** **5** **No Benefit**

7. Overall, I consider this workshop:

Excellent **1** **2** **3** **4** **5** **Poor**

Appendix C

Set 2 - Curriculum Correspondence, Instructional Organization and Monitoring Progress Modules

BEGIN
SET-2

1

SOFTWARE PREVIEW AND SELECTION
CURRICULUM CORRESPONDENCE

Software Preview and Selection

Computer assisted instruction should correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum.

INTRODUCTION: This module is intended to empower workshop participants in planning the use of CAI for instructing students with mild handicaps by increasing their skill in the selection of appropriate software to meet the curriculum needs of those students. The module is composed of Instructor Notes, with:

(A) Participant Handouts
(B) Transparencies
(C) A Workshop Evaluation Form

TIME REQUIRED: 75 minutes

TARGET AUDIENCE: Building change facilitators, special and regular education teachers of students with mild handicaps.

PARTICIPANT REQUIREMENTS:

A. Demonstrate familiarity with microcomputer.
B. Participate in workshop activities/discussions.
C. Be willing to invest time to preview software programs.

Software Preview and Selection

Curriculum Correspondence

Handout CC - 1

SHOW: Transparency 1.

REFER TO: Handout 1.

Introduction: This session will provide participants with a reminder of the necessity for a needs assessment before planning in regular instruction, and the focus will be on following similar strategies in using CAI. The practice element will be previewing software to fill unmet needs, and participants will be asked to recognize the importance of technology as a tool for the enhancement of instruction to meet student needs.

Curriculum Correspondence

SHOW Transparency 2.

OBJECTIVES

- ***To determine the scope and sequence of computer use in their own curricula.***
- ***To identify different types of software and their uses.***
- ***To use appropriate resources to select software (See Teachers' Resource Guide for sources).***
- ***To select appropriate software relevant to student, curriculum and content area needs***

DISCUSS: Effective teachers have always devised thoughtful lesson plans in order to make instruction efficient and appropriate for the students they teach, and many wrote lesson plans for their own edification even before administration dictated such practices. In January 1981, the Secretary of Education issued an interpretation of the individualized education program (IEP) requirements under Public Law 94-142. As part of this interpretation, the Department of Education reiterated that IEP objectives (also called short-term objectives) must be written before a child is placed in special education. The Department also stated that the IEP is not intended to be detailed enough to be used as an instructional plan. The following distinction was made in this regard: IEP objectives provide general (cont.)

benchmarks for determining progress toward meeting annual goals, and in many IEP formats different techniques or materials may be specifically mentioned for accomplishing the objectives. These objectives should be projected to be achieved over an extended period of time (e.g. an entire school quarter or semester). On the other hand, the objectives in classroom instructional plans deal with more specific outcomes that are to be accomplished on a daily, weekly, or monthly basis (Federal Register Vol. 46, #12, January 18, 1981). Basically, what classroom teachers do is take the IEP objectives and break them down into specific classroom instructional plans which agree with curriculum objectives. Teaching aids of any kind are selected with student needs in mind. The same must be true of all technology, and especially of software.

DEMONSTRATE Types of Software and their functions and uses.

Curriculum
Correspondence

Handout
CC - 2

SHOW: Transparencies 3, 4, 5,& 6.

REFER TO: Handout 2.

Drill and Practice

- ***present items***
- ***require response***
- ***use frequent interaction***
- ***reinforce content***

Tutorial Software Programs

- ***are intended to teach content, concepts, and skills***
- ***give examples, explanations, and illustrations***
- ***test learner's understanding***
- ***offer feedback and further help if needed***

Simulations

- ***model "real life"***
- ***used usually in science and social studies***
- ***involve decision-making, problem-solving and discovery***

Tools

- ***include word processors***
- ***are used in language arts***
- ***are used in content areas***
- ***support composition***
- ***simplify physical writing***

READ: TOOLS are described as "software to help get a job done." Only one kind of tool is presented on the overhead. Other tools include spreadsheets and data bases. Most elementary level students will be using the word processor. (Participants will have hands-on experience with previewing and describing all the above types of software.)

READ: **Procedures** (A) When writing lesson plans or IEPs include names of software programs which may appropriately meet student needs, and (B) When selecting software for use with students, consult written lesson plans or IEPs to determine student needs and to ascertain what software will contribute to the content area. There are four stages of learning: acquisition, maintenance, proficiency, and generalization.

Curriculum
Correspondence

SHOW: Transparency 7.

Four Stages of Learning

- *acquisition*
- *maintenance*
- *proficiency*
- *generalization*

READ AND DISCUSS: There are different goals for each of the four stages of learning and different types of software enable these goals to be accomplished.

Acquisition - the initial stage in which students learn to respond correctly to some form of instruction. Tutorial software is most useful during this stage.

Proficiency - the stage in which students develop fluency in responding. Drill and Practice software is most useful in this phase.

Maintenance - the stage during which students remember what has been learned over time. A combination of Drill and Practice and Tutorial (for remediation) is particularly useful in this phase.

Generalization - the stage in which the student is able to respond correctly in situations that are different from those in which acquisition, proficiency, and maintenance occurred. Simulation and problem-solving software are most helpful in this phase.

Workshop participants work in groups to discuss how technology may meet academic and personal needs before writing group plans regarding the selection of software.

Handout
CC - 3

REFER TO: Handout 3.

DISTRIBUTE questionnaire and direct participants to complete. (Instructions on next page.)

Software Selection Criteria Form

Directions: Listed below are some questions which should be considered in making software selection decisions. Please circle the number of your response to each question related to the curriculum for your students.

Software Selection Criteria Form

Responses			**Part I Basic Screening Criteria**
Place a (√) in correct answer.			
YES	**TO SOME EXTENT**	**NO**	
☐	☐	☐	1. Are the necessary hardware and accessories available for this software?
☐	☐	☐	2. Is this software age/skill level appropriate for targeted students?
☐	☐	☐	3. Are appropriate input devices accessible (e.g. joystick, mouse, game paddle, power pad)?
☐	☐	☐	4. Is the screen display (i.e. letters, numbers, graphics) clear and distinct?
☐	☐	☐	5. Is a thorough and complete teachers' guide included with this software package?
☐	☐	☐	6. Does the program operate without serious difficulty?
			Part II Selection and Use Criteria
☐	☐	☐	1. Is the reading level appropriate for my students?
☐	☐	☐	2. Are the prerequisites difficult for targeted students?
☐	☐	☐	3. Is the software presentation age-appropriate for targeted students?
☐	☐	☐	4. Is the content appropriate for targeted students' needs?
			5. Can this software be used for:
☐	☐	☐	a) basic content instruction?
☐	☐	☐	b) review and practice?
☐	☐	☐	c) enrichment?
☐	☐	☐	d) motivation?
			6. Can this software be used with:
☐	☐	☐	a) an individual?
☐	☐	☐	b) a small group?
☐	☐	☐	c) a whole class?

Place a (√) in correct answer.

			7. Is the software accurate in:
☐	☐	☐	a) content?
☐	☐	☐	b) punctuation, grammar and spelling?
☐	☐	☐	8. Are the students informed of their response accuracy via text, graphics or audio?
☐	☐	☐	9. Do the targeted students have adequate keyboarding skills required for this program?

Part III Optional Features

☐	☐	☐	1. Will assistance be needed for targeted students to use this software?
☐	☐	☐	2. Are "help" screens available for student use?
☐	☐	☐	3. Will the software accept variations of the correct answer (e.g. 50 or fifty)?
☐	☐	☐	4. Does the program provide feedback information (e.g. "You're adding instead of subtracting.")?
☐	☐	☐	5. Is the student required to redo tasks done incorrectly?
☐	☐	☐	6. Is the student informed of his/her cumulative score following a series of responses?
☐	☐	☐	7. Does the program automatically branch to another level based on student responses?
☐	☐	☐	8. Can speed and lesson length be adjusted?
☐	☐	☐	9. Does the software include a record-keeping system for the student and/or teacher use?
☐	☐	☐	10. Can the student exit and re-enter the program at any time?
☐	☐	☐	11. Can the software be modified or customized?
☐	☐	☐	12. Does the product include a student workbook and/or other supplementary materials?

ASK AND DISCUSS: Is there a link between daily instruction and the software that participants are going to select? Is the technical quality of the software sound and appropriate for the designated students?

Curriculum Correspondence

SHOW: Transparency 8.

DISCUSS: The intersection is the amount of software which is truly appropriate.

(Langhorne, M.J., Donhorm, J.O., Gross, J.F., and Rehmke, D. (1989) Teaching with computers: A new menu for the 90's. Phoenix, AZ: Oryx Press.)

ASK PARTICIPANTS TO:

- ***Write or discuss how software will enhance daily instruction.***
- ***Write or discuss what they will look for relevant to student needs.***
- ***Select curriculum congruent software for the appropriate CAI (Computer Assisted Instruction) and CMI (Computer Managed Instruction) of their students.***

DEMONSTRATE Appropriate software at different grade/functional levels during the modeling phase of the presentation.

Curriculum Correspondence

Handout
CC - 4

SHOW: Transparency 9.

REFER TO: Handout 4.

READ: Exemplars may be taken primarily from MECC (Minnesota Educational Computing Corporation) software unless local interest suggests teachers would prefer other software programs. This is a suggested list to illustrate that there is software available for each grade level and content area.

List of Software Exemplars

Reading:

Grade 1	*First Letter Fun - K-3 (MECC)*
Grade 2	*Phonics Prime Time - Vowels 1 (MECC)*
Grade 3	*Brick by Brick - Level 3 (Hartley)*
Grade 4	*Chariots, Cougars, and Kings (Hartley)*
Grade 5	*Those Amazing Reading Machines (MECC)*
Grade 6	*Words at work: Compound It! (MECC)*

Writing:

Grade 1	***The Story Machine (Spinnaker)***
Grade 2	***Language Experience Recorder (Teacher Support Software)***
Grade 3	***Student Stories (MECC)***
Grade 4	***Story Tree (Scholastic)***
Grade 5	***FredWriter - Prompted Writings (Public Domain)***
Grade 6	***Children's Writing & Publishing Cntr. (The Learning Company)***

Math:

Grade 1	***Counting Critters (MECC)***
Grade 2	***Circus Math (MECC)***
Grade 3	***Space Subtraction (MECC)***
Grade 4	***Quotient Quest (MECC)***
Grade 5	***Speedway Math (MECC)***
Grade 6	***Fraction Munchers (MECC)***

Handouts CC-5,6,& 7

REFER TO: Handouts 5, 6, & 7.

SHOW: Transparencies 10, 11, & 12.

Curriculum Correspondence

CASE STUDY: Instructor will guide participants through a case study (Handout #5) The case study analysis will be recorded on Handout #6. The selection of software which appears to meet the needs (curriculum and personal) of the student will be recorded. Reviewing Colin's areas of needs, which software pieces from Handout #4 might be appropriate for Colin? (Instructor and students preview suggested software and determine if it is appropriate for Colin.) If desired, at this time, teachers may choose to select software for a student of their choice, rather than working with the model provided by the instructor.

Curriculum Correspondence

SHOW: Transparency 13.

Guided Practice

- ***Preview software to meet student objectives suggested by group***
- ***Write lesson plans including the use of specific software programs to link CAI with daily instruction.***

(Participants use Handouts #6 [Case Study] and #7 (Lesson Plan] which correspond with Transparencies 11 and 12.)

CONDUCT: ***Evaluation through:***

- ***Question and Answer session***
- ***Discussion***
- ***Written Evaluation Sheet***

Curriculum
Correspondence

SHOW: Transparency 14.

Handout
CC - 8

REFER TO: Handout 8.

Strategies for participants to use after workshop

- ***Ask for scheduled time to preview software for use in your classroom.***
- ***Investigate all sources of software available to you (Local libraries, the LEA library, your own school software list, software of colleagues etc.).***
- ***Investigate commercial sources of curriculum congruent software to aid in selection. (See Resource Lists in Teachers' Resource Guide pp. 13-17).***
- ***Enhance your learning of what to look for in appropriate software for students with mild handicaps. (Attend workshops, take courses, seek out models of existing evaluation forms such as Choosing Educational Software. (Truett & Gillespie, 1984).***
- ***Use the aforementioned resources to look for software which matches student needs and curriculum objectives (Male, 1988).***

POST WORKSHOP ACTIVITY:

Independent Practice

- ***Participants independently write IEPs including use of CAI.***

Handout
CC - 6

REFER TO: Handout 6.

Case Study

- ***Participants independently write lesson plans including use of CAI***

Handout
CC - 7

REFER TO: Handout 7.

Lesson Plan

Handout
CC - 9

EVALUATION **End of Session. Have workshop Participants fill out Evaluation Form.**

Introduction

PLEASE COMPLETE
HANDOUT 1
IN YOUR
HANDOUT PACKET

(If you have not already done so.)

THANK YOU!

Participant Survey

Curriculum Correspondence

Handout
CC - 1

Name:______________________ District:______________________

Address:______________________ Telephone:______________________

School or Office:______________________ Grade Level:______________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:______________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1 — 2 — 3 — 4 — 5

(beginner) (competent/comfortable) (expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer? **YES** **NO**

3. Can you obtain further access by using a computer lab? **YES** **NO**

4. Do you know how to use many published software products? **YES** **NO**

5. Have you used a wide range of published software in your classroom? **YES** **NO**

6. Have you integrated many published software products into your:
    - weekly instructional plan? **YES** **NO**
    - daily lesson plan? **YES** **NO**

7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products? **YES** **NO**

Instructional Objectives

- To determine the scope and sequence of computer use in their own curriculum.
- To identify different types of software and their uses.
- To use appropriate resources to select software (See Teachers' Resource Guide).
- To select appropriate software relevant to student, curriculum, and content area needs.

Drill and Practice Programs

Drill and Practice Programs

- Present Items
- Require Response
- Use Frequent Interaction
- Reinforce Content

Tutorial Software Programs

- Intended to Teach: Content
  Concepts
  Skills
- Give: Examples
  Explanations
  Illustrations
- Test Learner's Understanding
- Offer Feedback and Further Help if Needed

SIMULATIONS

- Model "Real Life"
- Used usually in:
  - Science
  - Social Studies
- Involve: Decision-Making
  - Problem-Solving
  - Discovery

TOOLS

(Software to help get a job done-includes work processors)

- Are Used in Language Arts
- Are Used in Content Areas
- Support Composition
- Simplify Physical Writing

Types of Software

Curriculum Correspondence
Module 1

Handout
CC - 2

Educational software is mainly categorized into four groups, although they may sometimes overlap.

1. DRILL AND PRACTICE

These programs present items, require a response, and provide feedback. Activities are often presented as games or in arcade formats. Most of the available courseware is in this category. This software is useful to reinforce content or skills rather than to teach new concepts.

2. TUTORIAL

Tutorial software is intended to teach content, concepts, or skills. Examples, explanations, and illustrations are followed by opportunities to test the learner's understanding. The feedback may offer further explanations or more opportunities to practice the skill. Tutorial programs may also be presented in a game format.

3. SIMULATIONS

Simulations are models of "real life" situations and offer opportunities for problem-solving or discovery activities. In this type of program, students are often asked to make decisions leading to solutions for specific problems, which entail using previously learned skills or content in a meaningful way. Simulation programs are valuable for abstracting information and for generalizations.

4. WORD PROCESSORS

Word processing programs provide the primary use of computers in the language arts classrooms. There are many software programs for word processing, some of which are designed specifically for children (Bank Street Writer, Kidwriter, Magic Slate, and others). They simplify the physical act of writing while supporting the process model of instruction and composition on the entire spectrum from generating ideas and outlines to fluency and accuracy.

Software Selection Criteria Form

Curriculum Correspondence
Module 1

Handout
CC - 3

DIRECTIONS: Listed below are some questions which should be considered in making software selection decisions. Please check the box with your response to each question related to the curriculum for your students.

Name of software:________________________ Date: ______________

Responses — Part I Basic Screening Criteria

Place a (√) in correct answer.

YES	TO SOME EXTENT	NO	
☐	☐	☐	1. Are the necessary hardware and accessories available for this software?
☐	☐	☐	2. Is this software age/skill level appropriate for targeted students?
☐	☐	☐	3. Are appropriate input devices accessible (e.g. joystick, mouse, game paddle, power pad)?
☐	☐	☐	4. Is the screen display (i.e. letters, numbers, graphics) clear and distinct?
☐	☐	☐	5. Is a thorough and complete teachers' guide included with this software package?
☐	☐	☐	6. Does the program operate without serious difficulty?

Responses — Part II Selection and Use Criteria

☐	☐	☐	1. Is the reading level appropriate for my students?
☐	☐	☐	2. Are the prerequisites difficult for targeted students?
☐	☐	☐	3. Is the software presentation age-appropriate for targeted students?
☐	☐	☐	4. Is the content appropriate for targeted students' needs?
			5. Can this software be used for:
☐	☐	☐	a) basic content instruction?
☐	☐	☐	b) review and practice?
☐	☐	☐	c) enrichment?
☐	☐	☐	d) motivation?
			6. Can this software be used with:
☐	☐	☐	a) an individual?
☐	☐	☐	b) a small group?
☐	☐	☐	c) a whole class?

Place a (√) in correct answer.

Handout
CC - 3

			7. Is the software accurate in:
☐	☐	☐	a) content?
☐	☐	☐	b) punctuation, grammar and spelling?
☐	☐	☐	8. Are the students informed of their response accuracy via text, graphics or audio?
☐	☐	☐	9. Do the targeted students have adequate keyboarding skills required for this program?

Responses			**Part III Optional Features**
☐	☐	☐	1. Will assistance be needed for targeted students to use this software?
☐	☐	☐	2. Are "help" screens available for student use?
☐	☐	☐	3. Will the software accept variations of the correct answer (e.g. 50 or fifty)?
☐	☐	☐	4. Does the program provide feedback information (e.g. "You're adding instead of subtracting.")?
☐	☐	☐	5. Is the student required to redo tasks done incorrectly?
☐	☐	☐	6. Is the student informed of his/her cumulative score following a series of responses?
☐	☐	☐	7. Does the program automatically branch to another level based on student responses?
☐	☐	☐	8. Can speed and lesson length be adjusted?
☐	☐	☐	9. Does the software include a record-keeping system for the student and/or teacher use?
☐	☐	☐	10. Can the student exit and re-enter the program at any time?
☐	☐	☐	11. Can the software be modified or customized?
☐	☐	☐	12. Does the product include a student workbook and/or other supplementary materials?

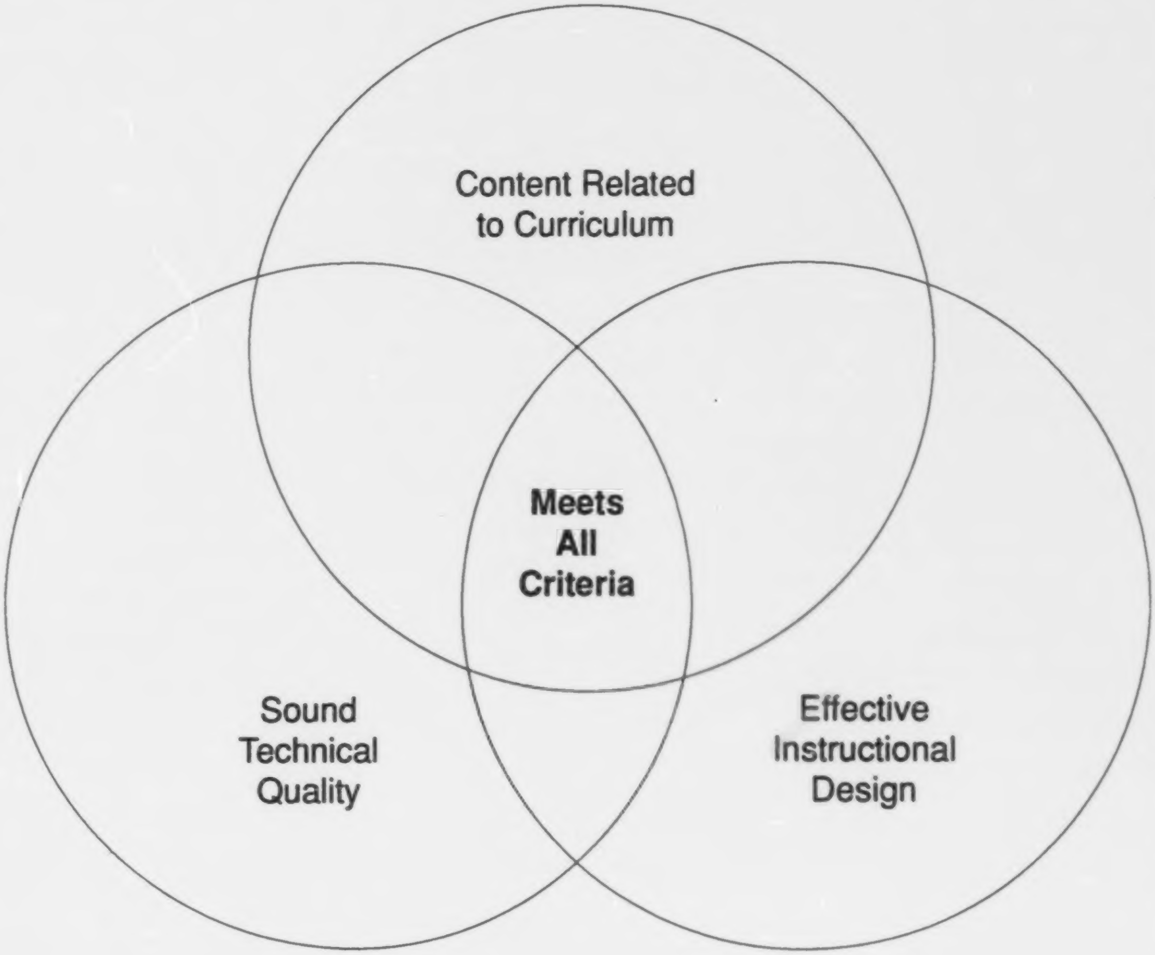
Four Stages of Learning

Curriculum
Correspondence
Module 1
T-7

Four Stages of Learning

- acquisition
- maintenance
- proficiency
- generalization

SOFTWARE SELECTION CRITERIA



Content Related to Curriculum

Meets All Criteria

Sound Technical Quality

Effective Instructional Design

(Langhorne, M.J., Donhorm, J.O., Gross, J.F., and Rehmke, D. (1989) Teaching with computers: A new menu for the 90's. Phoenix, AZ: Oryx Press.)

Software Exemplars

Handout
CC - 4

Reading:

Grade 1	First Letter Fun - K-3 (MECC)
Grade 2	Phonics Prime Time - Vowels 1 (MECC)
Grade 3	Brick by Brick - Level 3 (Hartley)
Grade 4	Chariots, Cougars and Kings (Hartley)
Grade 5	Those Amazing Reading Machines (MECC)
Grade 6	Words at Work: Compound It! (MECC)

Writing:

Grade 1	The Story Machine (Spinnaker)
Grade 2	Language Experience Recorder (Teacher Support Software)
Grade 3	Student Stories (MECC)
Grade 4	Story Tree (Scholastic)
Grade 5	FredWriter - Prompted Writings (Public Domain)
Grade 6	Children's Writing & Publishing Center (The Learning Center)

Math:

Grade 1	Counting Critters (MECC)
Grade 2	Circus Math (MECC)
Grade 3	Space Subtraction (MECC)
Grade 4	Quotient Quest (MECC)
Grade 5	Speedway Math (MECC)
Grade 6	Fraction Munchers (MECC)

Case Study #1 - Colin

Colin is an 8 year 10 months old third grade student who is receiving Level IV services for a total of 26 hours per week, and related services for 4 hours per week. He is described as having difficulties with articulation as well as with reading skills, and appears to function at least one year below grade level in the academic content areas of Reading, Language Arts, and Mathematics. The annual goals for this student in these content areas are described as:

READING

- **to increase word recognition skills**
- **to increase comprehension skills**
- **to increase word analysis skills**
- **to increase vocabulary level**
- **to increase reference skills**

LANGUAGE ARTS

- **to increase grammar mechanics skills**
- **to increase listening skills**
- **to increase spelling level**
- **to increase writing skills**

MATHEMATICS

- **to increase numeration skills**
- **to increase computation skills**
- **to increase measurement skills**
- **to increase geometry skills**

In Related Services, the annual goals for Colin were described as the need to improve articulation skills and to improve conversation and verbal directions.

What would be some specific instructional objectives for this student, and by what criteria would you evaluate them?

Case Study

Curriculum Correspondence
Module 1
T-11

Handout
CC - 6

SCHOOL:______________________________

STUDENT:______________________________

AGE:______________ GRADE:______________ LEVEL:______________

GOALS:______________________________

____

GOAL ACHIEVED:.........................

STRENGTHS	WEAKNESSES	RECOMMENDED % CORRECT	STRATEGIES RECOMMENDED	STRATEGIES WORKED

SOFTWARE PROGRAMS:______________________________

____

____

Student Lesson Plan

1. ANTICIPATORY SET:

Focus ______________________________

Practice ______________________________

Readiness ______________________________

2. OBJECTIVE:

The Purpose ______________________________

Indicate the Relevance ______________________________

3. INSTRUCTIONAL INPUT:

What? ______________________________

How? ______________________________

4. MODELING:

Acceptable Finished Product or a Process ______________________________

____

____

5. CHECKING FOR UNDERSTANDING

Activity ______________________________

Validation of Learning ______________________________

6. GUIDED PRACTICE

Relevant Task(s) ______________________________

Teacher Present (Help Available?) ______________________________

7. INDEPENDENT PRACTICE (Homework?)

Unassisted Performance ______________________________

Fluency of the Objective ______________________________

Guided Practice

- Preview software to meet student objectives suggested by group.
- Write lesson plans including the use of specific software programs to link CAI with daily instruction.

Strategies for Locating Software

- Ask for scheduled time to preview software for use in your classroom.

- Investigate all sources of software available to you (Local Libraries, the LEA library, your own school software list, software of colleagues, etc.)

- Investigate commercial sources of curriculum congruent software to aid in selection. (See Resource Lists in Teachers' Resource Guide).

- Enhance your learning of what to look for in appropriate software for mildly handicapped students. (Attend workshops, take courses, seek out models of existing evaluation forms such as Choosing Educational Software (Truett & Gillespie, 1984).

- Use the aforementioned resources to look for software which matches student needs and curriculum objectives (Male, 1988).

Workshop Evaluation

Curriculum Correspondence
Module 1

Handout
CC - 9

Title of Module (Session): ____________________

Location: ____________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

_______ Make the following changes:
_______ Try the following ideas:
_______ Add the following components:

____

____

by ____________ (date) I will be able to share the results with my principal and colleagues.

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 **Poor**

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 **Vague**

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 **Dull**

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 **Inadequate**

5. The presentation was:

Excellent 1 2 3 4 5 **Poor**

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 **No Benefit**

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 **Poor**

REFERENCES

Langhorne, M.J., Donhorm, J.O., Gross, J.F. and Rehmke, D. (1969) Teaching with Somputers: A new menu for the 90's. Phoenix, AZ: Onyx Press.

Male, M. (1988). Special Magic: Computers, classroom strategies, and exceptional students. Mountain View, CA: Mayfield Publishing Company.

U.S. Congress, Office of Technology Assessment. (1988, September). Power on! New tools for teaching and learning. (OTA-SET-379). Washington, DC: U.S. Government Printing Office.

Truett, C., and Gillespie, L. (1984) Choosing educational software: A buyer's guide. Littlejohn, Co.: Libraries Unlimited.

SOFTWARE COMPANIES

GAMCO INDUSTRIES, INC.
Subsidiary of Siboney Corp.
Box 1911
Big Spring, TX 79721
(915) 267-6327

HARTLEY COURSEWARE, INC.
133 Bridge Street
Dimondale, MI 48821
(800) 247-1380
MI 1-517-646-6458
FAX 1-517-646-8451

LEARNING COMPANY (THE)
6493 Kaiser Drive
Fremont, CA 94555
(800) 852-2255

MINNESOTA EDUCATIONAL COMPUTING CORPORATION (MECC)
3490 Lexington Ave. N.
St. Paul, MN 55126-8097
(612)481-3500
Help-line (612) 481-3660

SCHOLASTIC
P.O. BOX 7502
2931 East McCarty St.
Jefferson City, MO 65102
(800) 541-5513
(800) 392-2179 in MO

SPINNAKER SOFTWARE
215 First Street
Casmbridge, MA 02142

SUNBURST COMMUNICATIONS
101 Castleton Street
Pleasantville, NY 10570
(800) 628-8897
(800) 247-6756 in Canada

TEACHERS' SUPPORT SOFTWARE
PO Box 7130
Gainsville, FLA 32605
(800) 228-2871

MODULE
2

PLANNING FOR CURRICULUM CORRESPONDENCE

USE & EVALUATION
SESSIONS 1 & 2

Planning for Curriculum Correspondence: Use and Evaluation

Computer assisted instruction must correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum.

INTRODUCTION: This module, which is in two sections, is intended to help workshop participants:

a) use computer assisted instruction for students with mild handicaps by increasing their skill in the integration of appropriate software programs or tools with daily instruction to meet the curriculum needs of those students, and

b) with the task of evaluating computer use when it is integrated with daily instruction.

Each section of the module is composed of Instructor Notes, with:

- (A) Participant Handouts
- (B) Transparencies
- (C) A Workshop Evaluation Form

TIME REQUIRED: 90 minutes

TARGET AUDIENCE: Building change facilitators, special and regular education teachers of students with mild handicaps.

Planning for Curriculum Correspondence:
USE - Session 1

Introduction: This session will provide participants with strategies for using computers in the classroom as an integrated part of their daily instruction. The **focus** will be the link between regular instruction and computer assisted instruction in the **practice** of using advance organizers, specific materials and techniques in the instruction of students with mild handicaps.

Curriculum Correspondence

SHOW: Transparency 1.

REFER TO: Handout 1.

Handout CC - 1

Participant Survey Form

Curriculum Correspondence

SHOW: Transparency 2.

OBJECTIVES

- *To provide quick and easy access to appropriate software for students, and to use accompanying documentation efficiently*
- *To link software programs to daily non-CAI instruction through the use of description, explanation, and specific directions*
- *To group students for CAI according to skill needs and behaviors, using appropriate curriculum congruent software*
- *To schedule the use of curriculum congruent software programs in a way which is most effective and efficient for students with mild handicapping conditions*

Curriculum
Correspondence

SHOW: Transparency 3.

OBJECTIVE

To provide quick and easy access to appropriate software for their students, and to use accompanying documentation efficiently.

Curriculum
Correspondence

SHOW: Transparency 4.

Participant Requirements:

- ***Demonstrate familiarity with microcomputers in the classroom as well as knowledge of software types and programs***
- ***Participate in workshop activities/discussions***
- ***Be willing to invest time in finding out the most effective and efficient ways to integrate the use of software programs to enhance daily instruction***

DIRECT participants to ask themselves: Is there curriculum congruent software which will help me to teach this lesson or concept more efficiently?

Curriculum
Correspondence

Handout
CC - 2

SHOW: Transparency 5.

REFER TO: Handout 2.

DISCUSS: Some strategies or suggestions for teachers to follow in order to integrate computer use into daily lessons.

Strategies:

- ***Select software from appropriate source***
- ***Store software efficiently in classroom***
- ***Instruct students in how to access software quickly and easily***
- ***If students need to read accompanying documentation, instruct them ahead of time, making methods appropriate according to their individual needs***

continued...next page, (Suggestions for Successful Integration)

Suggestions for Successful Integration

- ***Read for students***
- ***Read with students***
- ***Give guidelines***
- ***Make cue cards which may be taped to monitor***

Curriculum
Correspondence

SHOW: Transparency 6.

OBJECTIVE

To link software to daily non-CAI instruction through the use of description, explanation, and specific directions

Curriculum
Correspondence

SHOW: Transparency 7.

Strategies:

Share lesson objectives with students before instruction and again as a reminder before students commence work on the computer.

If students need concrete manipulatives for concept learning, make sure they see connections between those materials and the computer programs.

DIRECT participants to ask themselves: What makes my regular instruction effective? What works well with these particular students? How can I link my regular techniques with the technology available to these students?

Curriculum
Correspondence

SHOW: Transparency 8.

OBJECTIVE

To group students for CAI according to skill needs and behaviors, using appropriate curriculum congruent software

Curriculum
Correspondence

Handout
CC - 3

SHOW: Transparency 9.

REFER TO: Handout 3.

Strategies:

- ***After matching software with the curriculum/learning needs of your students, decide whether students may be grouped or individualized for CAI.***

- ***Decide whether instructional objectives may be met by a student using the computer individually for short periods of time, or whether sharing the computer with other students demonstrating similar needs for longer periods of time would be more beneficial.***

What would influence these decisions?

- ***Academic skills***
- ***Social skills***
- ***Behaviors***

READ AND DISCUSS: Academic Skills: Students in Special Education may need different levels of instruction for different skill or content areas. e.g. low reading-high math. Software appropriate to different levels should be selected. Social Skills: Wise teachers know their students well enough to maximize learning potential and opportunities. Pairing or grouping students who do not work well together in other academic situations would be inappropriate for computer work. Behaviors: Although it has been noted that students are often more focussed and less distractible when working with computers, behaviors such as hyperactivity, which are inherent in a child, do not go away when the environment is changed. They may appear to be lessened at the computer, but they can re-surface at any time; so must be taken into consideration and provisions made for their control.

Curriculum
Correspondence

SHOW: Transparency 10.

Strategies

- ***Match readily available software to the identified instructional objectives of your students.***
- ***Group students according to needs and compatibility of software (format, reading level, graphics, vocabulary, terminology, etc.)***
- ***Decide on length of computer use period-specified time versus number of lessons or exercises.***
- ***Explain the link between regular daily instruction and computer use.***
- ***Before the student begins to work at the computer, use materials and techniques normally used in daily instruction to introduce the software program to be used (no longer than five minutes need be spent on introductory activities.)***

Curriculum
Correspondence

SHOW: Transparency 11.

OBJECTIVE

To schedule the use of curriculum congruent software programs in a way which is most effective and efficient for students with mild handicapping conditions

Curriculum
Correspondence

Handout
CC - 4

SHOW: Transparency 12.

REFER TO: Handout 4.

Example of Teacher Involvement

Students: *(Two) 3rd grade students*
Objective: *to practice punctuation skills - periods, question marks, exclamation marks.*
Software program: *End Punctuation (GAMCO)*
Strategy: *For five minutes before students go to the computer, teacher reviews the concept of end punctuation using the materials used in regular instruction. (Sentence strips, movable periods, etc.) Please make sure that students understand that they will be practicing this same concept on the computer. The teacher goes with students to the computer to introduce the software and give specific directions for use.*

Day 1: *After teacher introduction, students work Lesson 1 GAMCO program End Punctuation (Periods and Question Marks) Students report achievement either verbally to the teacher or by completing appropriate charts.*
Day 2: *Teacher reviews yesterday's work. Students will repeat Lesson 1 if necessary. Progress is reported at the end of the session.*
Day 3: *Teacher reviews all concepts already introduced in End Punctuation. Teacher uses student progress information to decide where students will continue.*
Day 4: *Students continue through Lesson 4 (Review).*

Progress is reported each day.

Curriculum
Correspondence

Handout
CC - 5

SHOW: Transparency 13.

REFER TO: Handout 5.

Specific Procedures for Day 1.
(See Example on next page.)

Examples of Procedures

Day 1:

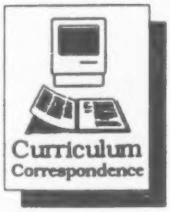
End Punctuation

Materials: Sentence strips, movable punctuation marks (comma, period, exclamation point.)

1. ***Student reads sentence.***
2. ***Ask what punctuation is needed.***
3. ***Students in turn place one mark at a time.***
4. ***Continue until all sentences have been punctuated by students.***
5. ***Remind students that Shift Key must be pressed to print "?" on computer screen.***
6. ***Rehearse location of Shift Key.***
7. ***Remind students that sentence is not complete without a period, even if other punctuation marks are inserted.***
8. ***After five minutes, teacher accompanies students to computer to introduce software program.***
9. ***Students work on computer for scheduled time or until criterion is reached.***

READ: This is a Drill and Practice program which is appropriate to use with two students having similar needs. This program is also teacher modifiable so that as many as 50 examples may be presented before reinforcement.

DISCUSS: Other software programs which teachers may know and which may be used in a similar manner.



SHOW: Transparency 14.

Curriculum Correspondence leads to Integration

READ: When teachers use Curriculum Objectives and IEP Objectives to drive their software selection, the software is said to have Curriculum Correspondence. In order to maximize the use of curriculum congruent software with students with mild and moderate handicaps, it is necessary to have Collaborative Decision-Making between teachers in the regular class and in the Resource Room. The resultant computer-assisted instruction is truly integrated into the whole instructional program of the students, enabling them to become an integrated part of the whole school.

Handout
CC - 6

EVALUATION

Conduct Evaluation through question and answer session and have participants fill out Evaluation Form.

End of Session 1/Module 2/USE and EVALUATION in Curriculum Correspondence.

Workshop Evaluation

Curriculum Correspondence
M-2-USE

Handout
CC - 6

Title of Module (Session):______________________________

Location:______________________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by______________ I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 **Poor**

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 **Vague**

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 **Dull**

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 **Inadequate**

5. The presentation was:

Excellent 1 2 3 4 5 **Poor**

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 **No Benefit**

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 **Poor**

Please Complete

Handout 1

Participant Survey

(if you have not already done so)

Thank You!

Participant Survey

Curriculum Correspondence
M-2-USE

Handout
CC - 1

Name:______________________ District:______________________

Address:______________________ Telephone:______________________

School or Office:______________________ Grade Level:______________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:______________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1 2 3 4 5

(beginner) (competent/comfortable) (expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer?	**YES**	**NO**
3. Can you obtain further access by using a computer lab?	**YES**	**NO**
4. Do you know how to use many published software products?	**YES**	**NO**
5. Have you used a wide range of published software in your classroom?	**YES**	**NO**
6. Have you integrated many published software products into your:		
• weekly instructional plan?	**YES**	**NO**
• daily lesson plan?	**YES**	**NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products?	**YES**	**NO**

OBJECTIVES

- To provide quick and easy access to appropriate software for their students, and use accompanying documentation efficiently.
- To link software programs to daily non-CAI instruction through the use of description, explanation, and specific directions.
- To group students for CAI according to skill needs and behaviors, using appropriate curriculum congruent software.
- To schedule the use of curriculum congruent software programs in a way which is most effective and efficient for students with mild handicapping conditions.

Objective

Curriculum Correspondence
M-2-USE
T-3

OBJECTIVE

To provide quick and easy access to appropriate software for students, and use accompanying documentation efficiently.

Participant Requirements

Curriculum Correspondence
M-2-USE
T-4

Participant Requirements:

- Demonstrate familiarity with microcomputers in the classroom as well as knowledge of software types and programs.

- Participate in workshop activities/discussions.

- Be willing to invest time in finding out the most effective and efficient ways to integrate the use of software programs to enhance daily instruction.

Strategies for Integrating Software

Curriculum Correspondence
M-2-USE
T-5

Handout
CC - 2

Strategies for Integrating Software:

- Select software from appropriate source.
- Store software efficiently in classroom.
- Instruct students in how to access software quickly and easily.
- If students need to read accompanying documentation, instruct them ahead of time, making methods appropriate according to their individual needs.

Suggestions for Successful Integration:

- Read for students
- Read with students
- Give guidelines
- Make cue cards which may be taped to monitor

Objective

Curriculum
Correspondence
M-2-USE
T-6

OBJECTIVE

To link software to daily non-CAI instruction through the use of description, explanation, and specific directions.

Strategies

- Share lesson objectives with students before instruction and again as a reminder before students commence work on the computer.
- If students need concrete manipulatives for concept learning, make sure they see connections between those materials and the computer programs.

Objective

Curriculum
Correspondence
M-2-USE
T-8

OBJECTIVE

To group students for CAI according to skill needs and behaviors, using appropriate curriculum congruent software.

Strategies for Linking Computer Assisted Instruction with Regular Instruction (part1)

Curriculum
Correspondence
M-2-USE
T-9

Strategies for Linking Computer Assisted Instruction with Regular Instruction:

- After matching software with the curriculum/ learning needs of your students, decide whether students may be grouped or individualized for CAI.

- Decide whether instructional objectives may be met by a student using the computer individually for short periods of time, or whether sharing the computer with other students demonstrating similar needs for longer periods of time would be more beneficial.

What would influence these decisions?

- Academic skills

- Social skills

- Behaviors

Strategies for Linking Computer Assisted Instruction with Regular Instruction (Part 2)

Curriculum Correspondence
M-2-USE
T-10

Strategies

- Match readily available software to the identified instructional objectives of your students.
- Group students according to needs and compatibility of software (format, reading level, graphics, vocabulary, terminology, etc.)
- Decide on length of computer use period - specified time versus number of lessons or exercises.
- Explain the link between regular daily instruction and computer use.
- Before the student begins to work at the computer, use materials and techniques normally used in daily instruction to introduce the software program to be used (no longer than five minutes need be spent on introductory activities.)

Handout
CC - 3

Strategies for Linking Computer Assisted Instruction with Regular Instruction:

- After matching software with the curriculum/learning needs of your students, decide whether students may be grouped or individualized for CAI.

- Decide whether instructional objectives may be met by a student using the computer individually for short periods of time, or whether sharing the computer with other students demonstrating similar needs for longer periods of time would be more beneficial.

What would influence these decisions?
- Academic skills
- Social skills
- Behaviors

Strategies

- Match readily available software to the identified instructional objectives of your students.

- Group students according to needs and compatibility of software (format, reading level, graphics, vocabulary, terminology, etc.)

- Decide on length of computer use period - specified time versus number of lessons or exercises.

- Explain the link between regular daily instruction and computer use.

- Before the student begins to work at the computer, use materials and techniques normally used in daily instruction to introduce the software program to be used (no longer than five minutes need be spent on introductory activities.)

OBJECTIVE

To schedule the use of curriculum congruent software programs in a way which is most effective and efficient for students with mild handicapping conditions.

Example of Teacher Involvement

Handout
CC - 4

Example of Teacher Involvement:

Students: (two) 3rd Grade Students

Objective: to practice punctuation skills-periods, question marks, exclamation marks.

Software Program: End Punctuation (GAMCO)

Strategy: For five minutes before students go to the computer, the teacher reviews the concept of end punctuation using the materials used in regular instruction. (Sentence strips, movable periods, etc.) Please make sure that students understand that they will be practicing this same concept on the computer. The teacher goes with students to the computer to introduce the software and give specific directions for use.

Day 1: After teacher introduction, students work Lesson 1 GAMCO program End Punctuation (Periods and Question Marks); students then report achievement either verbally to the teacher or by completing appropriate charts.

Day 2: Teacher reviews yesterday's work. Students will repeat Lesson 1 if necessary. Progress is reported at the end of the session.

Day 3: Teacher reviews all concepts already introduced in End Punctuation. Teacher uses student progress information to decide where students will continue.

Day 4: Students continue through Lesson 4 (Review). **Progress is reported each day.**

Example of Procedures

Day 1: **End Punctuation**

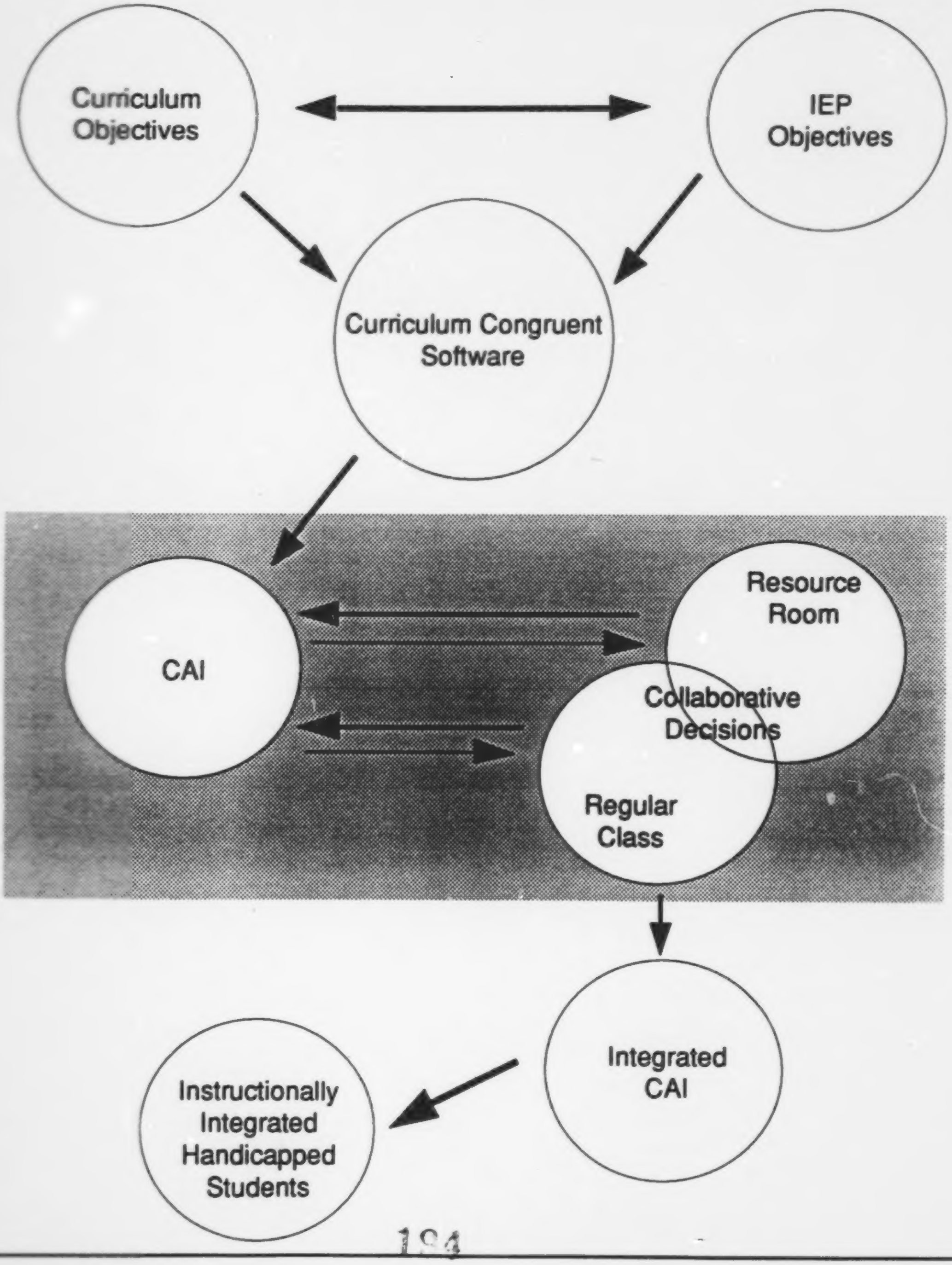
Materials: Sentence Strips, movable punctuation marks (Comma, period, exclamation point).

1. Student reads sentence.
2. Ask what punctuation is needed.
3. Students in turn place one mark at a time.
4. Continue until all sentences have been punctuated by students.
5. Remind students that Shift Key must be pressed to print "?" on computer screen.
6. Rehearse location of Shift key.
7. Remind students that sentence is not complete without a period, even if other punctuation marks are inserted.
8. After five minutes, teacher accompanies students to computer to introduce software program.
9. Students work on computer for scheduled time or until criterion is reached.

Curriculum Correspondence Leads to Integration

Curriculum Correspondence
M-2-USE
T-14

Curriculum Correspondence Leads to Integration



Curriculum Objectives

IEP Objectives

Curriculum Congruent Software

CAI

Resource Room

Collaborative Decisions

Regular Class

Integrated CAI

Instructionally Integrated Handicapped Students

Planning for Curriculum Correspondence: Session 2 - Evaluation

Computer assisted instruction must correspond appropriately to specific instructional objectives as well as to age/grade level scope and sequence of the curriculum.

Introduction: This session will provide workshop participants with ideas for evaluating computer assisted instruction when it is integrated with the daily instruction of students. The **focus** will be the link between regular instruction and technology as it relates to the practice of using charts, record sheets, verbal reporting, or other means for monitoring and evaluating progress. The evaluation of software assisted instruction is based upon already existing sound instructional practices regarding monitoring and evaluation of student progress.

MATERIALS REQUIRED: At least one copy of **Mastering Math Management System (MECC)** for demonstration purposes; several other software programs, which generate evaluation data, for preview and selection.

Curriculum Correspondence

SHOW: Transparency 1.

REFER TO: Handout 1.

Participant Survey Form

Handout CC - 1

Curriculum Correspondence

SHOW: Transparency 2.

OBJECTIVES
- *To evaluate student progress by monitoring the results of computer use through traditional methods (charts, recordbooks etc.)*
- *To evaluate student progress through computer generated information on screen or hard copy*

DISCUSS: Relevance of objectives.

READ: Research indicates that regular and frequent monitoring of student progress is a critical factor in effective instruction, especially for students with special needs.

Curriculum
Correspondence

SHOW: Transparency 3.

OBJECTIVE

To evaluate student progress by monitoring the results of computer use through traditional methods.

DISCUSS: Evaluation of student progress in regular instruction. Teachers use charts, record books, verbal reporting test results, etc. Participants may make other suggestions.

READ: What are the strategies for evaluating progress which can be utilized in computer assisted instruction?

Curriculum
Correspondence

Handout
CC - 2

SHOW: Transparency 4.

REFER TO: Handout 2.

Strategies

- ***Evaluate regularly to assess curriculum skill level growth.***
- ***Determine the frequency need for evaluation.***
- ***Select curriculum congruent software which will provide formative and summative assessment of instructional growth for your students.***
- ***Teach students how to report information from the computer screen.***

DISCUSS AND DEMONSTRATE: Software programs which show results of student achievement on screen, and discuss appropriate ways of recording the information. The suggested program for demonstration is: **Mastering Math Management System** (MECC) but participants may make other suggestions.

Model for the participants an acceptable finished product or a process: a chart or record from verbal reporting of screen information which reflects student achievement.

Curriculum
Correspondence

SHOW: Transparency 5.

OBJECTIVE

To conduct an evaluation of student progress through computer generated information of hard copy data

READ: Software programs which generate hard copy data recording student achievement are generally underutilized, primarily because teachers do not know enough about what they are able to do.

ASK participants if they are familiar with programs with record-keeping and generating features.

DEMONSTRATE:

Software programs which show results of student achievement on the computer screen and will also generate hard copy data. The suggested program is again Mastering Math Management System (MECC).

Curriculum
Correspondence

Handouts
CC-3-10

SHOW: Transparencies 6-13.

REFER TO: Handouts 3-10.

GUIDE participants through the Mastering Math program (example Quotient Quest) by means of transparencies which are copies of some of the computer generated screens.

DISCUSS: Exemplars of ways to capture and display achievement information.

ACTIVITIES

Participants will preview and select software which generates hard copy data related to student progress and achievement.

Participants will chart student progress by hard copy data generated by software program.

Handout
CC - 11

EVALUATION

CONDUCT: Evaluation through:

- Question and answer session
- Discussion
- Written Evaluation Sheet Handout 11

END OF SESSION

Independent Practice (post workshop activity)
Teachers will evaluate their own students' performance as above.

Introduction

Curriculum Correspondence
M-2-EVAL.
T-1

Please Complete

Handout 1

Participant Survey

(if you have not already done so)

THANK YOU!

Participant Survey

Curriculum Correspondence
M-2-EVAL.

Handout
CC - 1

Name:______________________ District:______________________

Address:______________________ Telephone:______________________

School or Office:______________________ Grade Level:______________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:______________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert.**)

1	2	3	4	5
(beginner)		(competent/comfortable)		(expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

   100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer? **YES** **NO**
3. Can you obtain further access by using a computer lab? **YES** **NO**
4. Do you know how to use many published software products? **YES** **NO**
5. Have you used a wide range of published software in your classroom? **YES** **NO**
6. Have you integrated many published software products into your:
   - weekly instructional plan? **YES** **NO**
   - daily lesson plan? **YES** **NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products? **YES** **NO**

OBJECTIVES

At the end of the workshop, participants will be able to evaluate student progress in the integrated use of computer assisted instruction:

- by monitoring the results of computer use through traditional methods:
  - charts
  - record books
  - verbal reporting, etc.

- through computer generated information on screen or hard copy data.

Objective

Curriculum Correspondence
M-2-EVAL.
T-3

OBJECTIVE

To be able to evaluate student progress by monitoring the results of computer use through traditional methods:

- charts
- record books
- verbal reporting, etc.

Handout
CC - 2

Strategies for Evaluating Progress

- Evaluate regularly to assess curriculum skill level growth.

- Determine the frequency need for evaluation.

- Select curriculum congruent software which will provide formative and summative assessment of instructional growth for your students.

- Teach students how to report information from the computer screen.

OBJECTIVE

To conduct an evaluation of student progress through computer generated information of hard copy data.

Curriculum Correspondence
M-2-EVAL. T-6

Handout
CC - 3

STUDENT PROGRESS CHART

NAME________________________ CAI ACTIVITY________________________

GAME	DATE	SCORE									

Check Student Progress

Curriculum Correspondence
M-2-EVAL.
T-7

Handout
CC - 4

Check Student Progress

Options:

1. Quick report (shows only the most recent progress for each student.)
2. Complete report (shows all results for students.)
3. Lesson report (lists results for all students for any lesson.)
4. Return to Teacher Options menu.

Which number?

Teachers' Options Menu

Curriculum
Correspondence
M-2-EVAL.
T-8

Handout
CC - 5

TEACHERS' OPTIONS MENU

Options:

1. Register new students.
2. Add, change, or delete data.
3. Check student progress.
4. Check notices.
5. Reactivate a student.

Other Options:

6. General information.
7. Printer support.
8. Diskette support.
9. Return to main program.
10. End.

Which Number?

Quick Report

Handout
CC - 6

Quick Report

This report is available for:

1. individual students

2. entire group

Which Number? ☐

Reports for Students

Curriculum Correspondence
M-2-EVAL.
T-10

Handout
CC - 7

Group Name:

1. ______
2. ______
3. ______
4. ______
5. ______
6. ______
7. ______
8. ______
9. ______
10. ______
11. ______
12. ______

Group Name:

13. ______
14. ______
15. ______
16. ______
17. ______
18. ______
19. ______
20. ______
21. ______
22. ______
23. ______
24. ______

Enter the student numbers (one at a time) that you want reports for:

Are you done?

Do you want a report printed using a printer?

Please prepare your printer.

Complete Report

Handout
CC - 8

Complete Report

This report is available for:

1. individual students
2. entire group

Which Number? ☐

Sample Computer Screen

Curriculum Correspondence
M-2-EVAL.
T-12

Handout
CC - 9

GROUP: Grade 4 Math

NAME: Kelly S.

	OPERATION	TRIES	BEST SCORE	MASTERED
PROGRAM: Surprise Package	+	1	18/20	YES
Magic Flag	/	1	19/25	NO

Handout
CC - 10

LESSON REPORT

Diskettes:

1. Early Addition
2. Circus Math
3. Addition Logician
4. Space Subtraction
5. Subtraction Puzzles
6. Multiplication Puzzles
7. Quotient Quest

Which diskette is the lesson on? ☐

Workshop Evaluation

Curriculum Correspondence
M-2-EVAL.

Handout
CC - 11

Title of Module (Session): ______________________________

Location: ______________________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by____________________I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 Poor

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 Vague

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 Dull

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 Inadequate

5. The presentation was:

Excellent 1 2 3 4 5 Poor

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 No Benefit

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 Poor

SET-2: INSTRUCTION
Instructional Organization

MODULE
3
INSTRUCTIONAL ORGANIZATION

Instructional Organization

The use of the microcomputer as an instructional tool should be an integral component of organizing students for instruction.

INTRODUCTION: This module will provide participants with strategies for integrating computers into instruction. The module is composed of Instructor Notes, with:

(A) Participant Handouts
(B) Transparencies
(C) A Workshop Evaluation Form

TIME REQUIRED: 75 to 90 minutes.

TARGET AUDIENCE: Building change facilitators, special and regular education teachers of students with mild handicaps.

PARTICIPANT REQUIREMENTS:

A. Participation in workshop activities/discussions.
B. Interest and willingness to increase facility with computers in the classroom.
C. Interest and willingness to practice instructional organization for integrating technology.

Module 3

Instructional Organization

Introduction: This session will provide participants with management strategies for integrating computers into classroom instruction. The **focus** will be on using computers as an integral part of daily instruction. Teachers routinely **practice** classroom management strategies to establish optimal conditions for instruction. **Readiness** for the integration of CAI into instruction is based upon existing organizational strategies for implementing effective instruction.

Instructional Organization

Handout
IO - 1

SHOW: Transparency 1.

REFER TO: Handout 1.

Participant Survey Form

READ: Instructional Organization involves the classroom management aspects of integrating computer instruction into daily instruction. Teachers must make decisions regarding materials to use for instruction, teaching strategies, and assessment procedures. For technology to be integrated, the role of computer instruction must be considered in these decisions.

Students with mild handicaps can become actively engaged in their learning by using computers during instruction. Computers have a great potential for making the teaching/learning process more exciting, more efficient, and more meaningful for both teachers and students.

Instructional Organization

SHOW: Transparency 2. Read Objectives.

OBJECTIVES

- ***To identify pre-instructional variables for planning the integration of computers into the curriculum.***
- ***To identify classroom variables related to the effective implementation of CAI activities.***

- ***To plan daily lesson activities integrating the use of computers for instruction.***

READ: The first objective refers to instructional variables to consider in planning the integration of computers into the curriculum.

Teachers often express a great deal of concern about using computers. They ask themselves *"How will I find time to prepare for using the computer as well as my regular instruction? Will students rush through their work to be the first at the computer station? How can I provide everyone a chance to use the computer? How can I ensure that my students are able to successfully and quietly use the computer? How can I individualize the CAI so that it is appropriate for each student? How do I know that my students are on-task?"* Do these questions sound familiar? Are you able to relate to some or all of these questions?

DISCUSS: Participant comments on these concerns and any others that may be introduced.

ASK: What, then, are the advantages of using computers in the classroom?

Instructional Organization

SHOW: Transparency 3.

Advantages

Computer Assisted Instruction can:

- ***Be efficient and cost effective***
- ***Assess student needs***
- ***Individualize instruction***
- ***Reinforce existing skills***
- ***Increase productivity***
- ***Collect and analyze performance data***

ASK: How do these advantages enhance classroom instruction for students with mild handicaps?

READ: Pre-instructional variables include the physical arrangement of the classroom and equipment, the grouping of students, the scheduling of students for computer instruction, and the on-going monitoring of students. These variables must be considered in planning the use of computers for instruction.

Instructional planning includes the teacher's decisions regarding the best approach for delivering the lesson. Content delivery decisions consider instructional environmental features related to **history** and **events**.

Instructional Organization

SHOW: Transparency 4.

Classroom Environmental Features

***History**: the relationships and experiences of the students and teacher from the beginning of the school year*

***Events*:**

- *Daily occurrences*
- *Public-interactions between students and teachers*
- *Multiple events taking place at the same time*
- *Planned occurrences*
- *Unplanned occurrences*

DISCUSS: Examples of history and events from participants' own classroom experiences, and how the situations were handled. How does the additional factor of the computer affect these situations?

Instructional Organization

SHOW: Transparency 5.

OBJECTIVE

- ***To identify classroom variables related to the effective implementation of CAI activities.***

READ: The effective and smooth implementation of CAI activities requires consideration for instructional delivery variables in the classroom.

Instructional Organization

SHOW: Transparency 6.

Classroom Variables

- ***Placement of computers and software***
- ***Number of students in class***
- ***Time scheduled for computer use***
- ***Class rules for computer use***
- ***Students' curriculum objectives***
- ***Students' differing abilities and skills***
- ***Assistance required***

READ: Extraneous variables may interfere with instruction, but there are some factors over which the teacher has some control.

ASK: How can the teacher orchestrate the classroom environment to foster high levels of achievement for students?

Instructional Organization

SHOW: Transparency 7.

Strategies For Orchestrating The Computer Learning Environment

- ***Place computers and software in an easily accessible location.***
- ***Group students appropriately at the computer.***
- ***Determine appropriate length of time at the computer for quality learning.***
- ***Allocate computer time for each student and post written schedule.***
- ***Establish rules for computer use.***
- ***Match computer tasks to student abilities and student needs.***
- ***Provide methods for seeking assistance.***

DISCUSS: Individual methods for implementing each of these strategies.

READ: Placement decisions for locating and arranging computers and software in either the classroom or lab should account for the accessibility and comfort of the students who are to use the equipment. Detailed instructions should be provided for accessing the software, working the computer, and completing the session. The software and the instructional objectives for using the program should be considered in grouping students and determining the length of the session. A kitchen timer may be useful for reminding students of the length of the session. Careful attention to procedures for seeking assistance ensures smooth implementation of computers for instruction.

Instructional Organization

SHOW: Transparency 8.

Rules for Computer Use

- *Check computer schedule*
- *Work quietly*
- *Follow procedures for assistance*
- *Complete computer activity*
- *Record session score*
- *Replace disk in appropriate place*
- *Turn off computer and monitor*

READ: These are only **suggested** rules for computer use. The instructional environment will control, to some extent, the most appropriate rules for individual situations. Rules should be presented and posted in a prominent place to allow the students to check appropriate procedures conveniently.

DISCUSS: Variations of rules for students working at the computer in (a) groups, and (b) labs.

Instructional Organization

Handout IO-2

SHOW: Transparency 9.

REFER TO: Handout 2.

Sample Computer Schedule

Date	Time	Student(s') Name	Program to Use

READ: This is an example of a computer schedule that could be used for individual or group scheduling. Ideally, it should be posted in a highly visible area so that students can easily check their computer time and the program to be used. A posted schedule helps to alleviate confusion and management problems which may arise. The length of computer time may be determined according to type of program, the purpose of the computer session, and individual differences among the students. Generally, research has indicated that the suggested length of computer time is approximately 15 minutes. However, the length of a single lesson and the student's attention span should also be considered in planning the time allotment for CAI sessions.

Instructional Organization

SHOW: Transparency 10.

Considerations For Grouping Students

- ***Room size***
- ***Number and availability of computers***
- ***Academic skills***
- ***Social skills***
- ***Availability of instructional assistants/volunteers***

READ: Most of these factors are not under teacher control. However, they are important considerations for grouping students at the computer.

DISCUSS: Strategies that can be used for effective grouping arrangements.

READ: Research provides guidelines for grouping students appropriately with regard to the type of software used.

Instructional Organization

SHOW: Transparency 11.

Handout IO - 3

REFER TO: Handout 3.

Grouping For Software

Type	Purpose	Assigned Students

DISCUSS: Information from previewing software that should be considered in planning grouping arrangements for using computers.

Instructional Organization

SHOW: Transparency 12.

OBJECTIVE

To plan daily lesson activities integrating the use of CAI

READ: Effectively organized instruction that integrates computers requires that teachers apply effective teaching strategies in lesson planning. Decisions involve consideration of all the individual and situational variables for facilitating student learning.

ASK: What constitutes "best teaching practices" in planning lessons for traditional instruction?

ACTIVITY: Divide participants into small groups to develop list of "best practices".

Instructional Organization

SHOW: Transparency 13.

REFER TO: Handout 4.

Handout IO - 4

Participant's Best Practices

Have participants list strategies considered "best practices" on Handout #4. After about 15 minutes, share lists for commonalities. Write participants' responses on Transparency 13.

Examples of responses might be:

- ***Get Attention***
- ***Review - to ensure appropriate task assignment***
- ***Time on task related to aptitude***
- ***Opportunity to learn (length of time allowed)***
- ***Perseverance***
- ***Feedback - Teacher Involvement***
- ***Learning Outcomes - check for understanding***
- ***Evaluation***

DISCUSS: How responses lead to student achievement in traditional instruction.

ASK: Are the practices possible with CAI? How?

Handout IO - 5

EVALUATION

Have participants complete the evaluation form included in the Handout Packet. End of Session.

Please complete
Handout 1
Participant Survey
(If you have not already done so.)

Thank you!

Participant Survey

Instructional Organization
Module 3

Handout
IO - 1

Name:______________________ District:______________________

Address:______________________ Telephone:______________________

School or Office:______________________ Grade Level:______________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:______________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1	**2**	**3**	**4**	**5**
(beginner)		(competent/comfortable)		(expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer? **YES** **NO**
3. Can you obtain further access by using a computer lab? **YES** **NO**
4. Do you know how to use many published software products? **YES** **NO**
5. Have you used a wide range of published software in your classroom? **YES** **NO**
6. Have you integrated many published software products into your:
    - weekly instructional plan? **YES** **NO**
    - daily lesson plan? **YES** **NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products? **YES** **NO**

OBJECTIVES

- To identify pre-instructional variables for planning the integration of computers into the curriculum.

- To identify classroom variables related to the effective implementation of CAI activities.

- To plan daily lesson activities integrating the use of computers for instruction.

Advantages

Advantages

Computer Assisted Instruction Can:

- Be efficient and cost effective
- Assess student needs
- Individualize instruction
- Reinforce existing skills
- Increase productivity
- Analyze performance data

Classroom Environmental Features

History - the relationships and experiences of the students and teacher from the beginning of the school year.

Events -
- Daily occurrences
- Public-interactions between students and teachers
- Multiple events taking place at the same time
- Planned occurrences
- Unplanned occurrences

OBJECTIVE

To identify classroom variables related to the effective implementation of CAI activities.

Classroom Variables

- Placement of computers and software
- Number of students in class
- Time scheduled for computer use
- Class rules for computer use
- Students' curriculum objectives
- Students' differing abilities and skills
- Assistance required

STRATEGIES FOR ORCHESTRATING THE COMPUTER LEARNING ENVIRONMENT

- Place computers and software in an easily accessible location.

- Group students appropriately at the computer.

- Determine appropriate length of time at the computer for quality learning.

- Allocate computer time for each student and post written schedule.

- Establish rules for computer use.

- Match computer tasks to student abilities and student needs.

- Provide methods for seeking assistance.

Rules for Computer Use

RULES FOR COMPUTER USE

- Check computer schedule
- Work quietly
- Follow procedures for assistance
- Complete computer activity
- Record session score
- Replace disk in appropriate place
- Turn off computer and monitor

Sample Computer Schedule

**Handout
IO- 2**

SAMPLE COMPUTER SCHEDULE

Date	Time	Student(s') Name(s)	Program to Use

Considerations for Grouping Students

- **Room Size**
- **Number and Availability**
- **Academic Skills**
- **Social Skills**
- **Availability of instructional assistants/volunteers**

Grouping for Software

Instructional Organization
Module 3
T-11

Handout
IO- 3

GROUPING FOR SOFTWARE

Type	Purpose	Assigned Students

OBJECTIVE

To plan daily lesson activities integrating the use of computers for instruction.

Participant's Best Practices

Handout
IO - 4

PARTICIPANT'S BEST PRACTICES

Workshop Evaluation

Instructional Organization
Module 3

Handout
IO - 5

Title of Module (Session):____

Location:____

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by______________________I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 **Poor**

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 **Vague**

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 **Dull**

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 **Inadequate**

5. The presentation was:

Excellent 1 2 3 4 5 **Poor**

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 **No Benefit**

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 **Poor**

MODULE

4

INSTRUCTIONAL ORGANIZATION

Instructional Organization

The use of the microcomputer as an instructional tool should be an integral component of organizing students for instruction.

INTRODUCTION: This module is intended to provide participants with strategies for integrating computers into instruction. The module is composed of Instructor Notes, with:

- (A) Participants Handouts
- (B) Transparencies
- (C) A Workshop Evaluation Form

TIME REQUIRED: 75-90 minutes.

TARGET AUDIENCE: Building change facilitators, special and regular education teachers of students with mild handicaps.

PARTICIPANT REQUIREMENTS:

A. Participation in workshop activities and discussions.
B. Interest and willingness to increase facility with computers in the classroom.
C. Interest and willingness to practice instructional organization strategies for integrating technology.

Instructional Organization

Introduction: This session will provide participants with delivery variables for the implementation of CAI. The **focus** will be on the identification and evaluation of classroom variables which affect the use of computers for instruction. **Practice** identifying the classroom variables will be provided. **Readiness** for the effective implementation of CAI is based upon already existing sound instructional principles used in regular non-CAI instruction.

Instructional
Organization

SHOW: Transparency 1.

REFER TO: Handout 1.

Handout
IO - 1

Participant Survey Form

Instructional
Organization

SHOW: Transparency 2.

OBJECTIVES

- ***To identify strategies for organizing instruction for effectively integrating the use of computers.***
- ***To implement effective strategies for integrating CAI through teacher interactions with computer-using students.***
- ***To evaluate the effectiveness of using computers for instruction.***

READ: Teachers must decide *what, when, how, who,* and *under what circumstances* instruction is to be provided. Planning involves making decisions regarding the best approach for delivering the day's instruction. These same factors should also be considered in organizing instruction with microcomputers. Teachers may conduct a self-assessment to identify the instructional strategies that work best for them. Example self-assessment questions are listed in the Analysis of Instructional Strategies.

Instructional Organization

SHOW: Transparency 3.

Analysis of Instructional Strategies

What makes my regular instruction so effective?

What works with my particular students?

How can I link established instructional strategies with the use of computers?

What procedures should I establish for using the computer?

How can I evaluate the effectiveness of using computers?

DISCUSS: The questions proposed in the self-assessment.

Instructional Organization

Handout
IO - 2

SHOW: Transparency 4.

REFER TO: Handout 2.

Weekly Instructional Objectives

Subject	Objectives
Reading	
Math	
Language Arts	

READ: This chart could be used for listing general objectives for the week.

DISCUSS: The inclusion of computer use in the weekly objectives for students.

ACTIVITY

Participants work together to write sample objectives on the chart. (Allow 5 - 10 minutes for this exercise.)

Instructional

Handout
IO - 3

SHOW: Transparency 5.

REFER TO: Handout 3.

Daily Computer Schedule

Week of : ______________________

DAY	TIME	STUDENT'S NAME	CONTENT/PROGRAM
Mon.			
Tues.			
Wed.			
Thur.			
Fri.			

READ: The chart in Transparency 5 may be useful for planning daily computer activities related to weekly instructional objectives. Under each day, the computer activity may be listed for each curriculum area. Preparing a written schedule of computer activities for each day facilitates the organization of instruction to include the use of computers. Actively making decisions to schedule CAI for specific objectives increases the likelihood that the computer will be used in an effective and efficient way.

Once teachers have established rules and procedures, selected appropriate software and grouped students for computer use, they should consider the arrangement of the classroom to ensure that the physical environment is also conducive to learning. Even with several activities going on in the room at the same time, the teacher should be able to observe all students and maintain a conducive learning environment. Traffic flow must be considered as well as the areas for other instructional activities.

Instructional
Organization

Handout
IO - 4

SHOW: Transparency 6.

REFER TO: Handout 4.

CLASSROOM ASSIGNMENT: Draw a diagram of your classroom indicating the arrangement of the computer(s), student desks, teacher's desk, and any other physical features you wish to consider in using computers for instruction.

ACTIVITY

Use Handout 4 to design an appropriate classroom arrangement for placing the computers, other learning stations and furnishings.

DISCUSS: Variations of arrangements suggested by participants.

Instructional Organization

SHOW: Transparency 7.

OBJECTIVE

To implement strategies for integrating CAI through teacher interactions with computer-using students.

READ: During instruction, teachers monitor students as they work and constantly adjust the level or pace of the instruction to accommodate the level of learning. Teacher contact while students are on-task facilitates a high success rate, while ensuring that the instruction is appropriately challenging without becoming frustrating. This is accomplished by interactive teacher behaviors which have been found to correlate significantly with student achievement as well as with student engagement (Filby & Cahen, 1978).

Instructional Organization

SHOW: Transparency 8.

Interactive Teaching Behaviors

Substantive

- ***Presentation:***
  Explanation - planned
  Explanation - as needed
- ***Monitoring:***
  Academic observation
  Academic questioning
- ***Feedback:***
  Academic feedback

Procedural

- ***Presentation:***
  Structured/direct instruction
  Explanation
- ***Feedback:***
  Task engagement feedback
  Evaluation feedback

READ: Teaching behaviors may be considered in terms of substantive and procedural behaviors. The substantive behaviors relate to delivery of the content of the lesson. Procedural behaviors relate to the procedural aspects of instructional organization dealing with how the instruction is delivered. Both types of behavior should be considered for determining effective teacher contact during regular instruction.

DISCUSS: Descriptions of behaviors in the following contexts: (a) the teacher's explanation of academic content as part of the regular lesson; (b) the teacher's explanation of academic content in response to a clear and immediate student need for help.

Handout
IO - 5

REFER TO: Handout 5.

Divide participants into small discussion groups to generate examples for each of the following situations:

- ***The teacher looks at or listens to an academic response.***
- ***The teacher asks the student for written or oral answers.***
- ***The teacher tells the student whether the answer is right /is wrong.***
- ***The teacher states the goals of instruction or gives directions about the procedures and activities the student should carry out.***

ASK: How do teacher behaviors apply to using the computer for instruction?

Instructional
Organization

SHOW: Transparency 9.

Teacher Contact with Computer-using Students

Substantive

Presentation:
- ***Explanation before computer use***
- ***Explanation during computer use as needed***

Monitoring:
- ***Academic observation during computer use***
- ***Academic questioning during computer use***

Feedback:
- ***Academic feedback during and after computer use***
- ***Behavioral reinforcement***

READ: Teacher contact with computer-using students can be categorized as substantive or procedural. Substantive behaviors dealing with presentation of instruction may be an explanation before and/or during computer use. Academic monitoring involves observation and questioning during computer use. Finally, both feedback and reinforcement may occur during computer use while students are interacting with the computer.

Instructional Organization

SHOW: Transparency 10.

Procedural

Presentation before computer use:
Structured/direct instruction
Explanation

Feedback:
Task engagement feedback
Evaluation feedback

READ: Procedural teaching behaviors deal with the explanation, structure, and feedback regarding how the computer is used. Both substantive and procedural teaching behaviors are applicable for computer using situations. In fact, the organization of instruction and teacher involvement with the student while engaged in the computer activity are critical for the effective integration of computer instruction. Integrated with regular instruction, technology enhances learning and increases efficiency.

Instructional Organization

SHOW: Transparency 11.

OBJECTIVE

To evaluate the effectiveness of using computers for instruction.

READ: Teachers use a variety of strategies for determining if the computer activity is appropriate for students.

SHOW: Transparency 12.

Observations of Students

- ***Body language***
- ***Methods of obtaining answers***
- ***Actions and reactions***
- ***Willingness/refusal to work***
- ***Engagement in activities***
- ***Interaction with peers***
- ***On-task behavior***
- ***Responses - verbal and written***

READ: Observing student behavior can provide a wealth of information regarding the student's reaction to and interaction with the activity. If the activity is interesting and exciting, it is evident from observing the student at the computer and from evaluating the performance on the task. On the other hand, if the student is bored, withdrawn or frustrated, it is also obvious that no learning is occurring.

DISCUSS: Examples of student actions that indicate whether learning is occurring.

READ: These strategies facilitate the evaluation of on-going instruction. The effectiveness of the computer activity may answer questions such as: *Are the expectations for learning being met? Is the instruction flowing smoothly? Are refinements or changes needed? If so, what are they?* Basic strategies for implementing and evaluating effective instruction are applicable for effectively integrating technology.

ASK: How can the teacher determine whether an individual or group activity is appropriate?

READ: The management options in many software packages may also provide the teacher with additional information to determine if students are successful in completing the defined task. This information is another indication of the effectiveness of the instruction.

SHOW: Transparency 13.

Teacher- Controlled Variables

- ***Communication of expectations***
- ***Establishment of rules and procedures for behavior and academic activities***
- ***Appropriate room arrangements***
- ***Consistent organization and procedures***

READ: The effectiveness of using computers for instruction may also be a factor of the classroom climate. An environment not conducive to learning will impede computer assisted instruction as it does non-computer assisted instruction.

DISCUSS: Teacher-controlled variables that influence the success of the student.

Instructional Organization

SHOW: Transparency 14.

Remember to be Flexible and:
If it doesn't work for you...
change it...
and keep on changing ...
until
you have a system that works
for you!

ACTIVITY

Preview software considering the instructional organization factors which will affect effective use.

DISCUSS: The implications for grouping, scheduling and teacher interactions for using computers with students with special needs.

Handout
IC - 6

EVALUATION

Have participants complete the evaluation form.
End of Session.

Introduction

Please complete

Handout 1

Participant Survey

(if you have not already done so)

Thank you!

Participant Survey

Instructional Organization
Module 4

Handout
IO - 1

Name:____________________ District:____________________

Address:____________________ Telephone:____________________

School or Office:________________ Grade Level:____________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:____________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1	2	3	4	5
(beginner)		(competent/comfortable)		(expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer?	**YES**	**NO**
3. Can you obtain further access by using a computer lab?	**YES**	**NO**
4. Do you know how to use many published software products?	**YES**	**NO**
5. Have you used a wide range of published software in your classroom?	**YES**	**NO**
6. Have you integrated many published software products into your:		
• weekly instructional plan?	**YES**	**NO**
• daily lesson plan?	**YES**	**NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products?	**YES**	**NO**

Objectives

OBJECTIVES

- To identify strategies for organizing instruction for effectively integrating the use of computers.
- To implement strategies for integrating CAI through teacher interactions with computer-using students.
- To evaluate the effectiveness of using computers for instruction.

Analysis of Instructional Strategies

- What makes my regular instruction so effective?
- What works with my particular students?
- How can I link established instructional strategies with the use of computers?
- What procedures should I establish for using the computer?
- How can I evaluate the effectiveness of using computers?

Weekly Instructional Objectives

Instructional Organization
Module 4
T-4

Weekly Instructional Objectives

Handout
IO - 2

Subject	Objectives
Reading	
Math	
Language Arts	

Daily Computer Schedule

Handout
IO - 3

Week of: ______________________________

DAY	TIME	STUDENT'S NAME	CONTENT/PROGRAM
MON.			
TUES.			
WED.			
THUR.			
FRI.			

Classroom Arrangement for Computer Use

Handout
IO - 4

Classroom Arrangement for Computer Use - DIRECTIONS: Draw a diagram of your classroom indicating the arrangement of the computer(s), student desks, teacher's desk, and any other physical features you wish to consider in using computers for instruction.

Objective

OBJECTIVE

To implement strategies for integrating CAI through teacher interactions with computer-using students.

Interactive Behaviors

Interactive Teaching Behaviors

Substantive

- Presentation:
  - Explanation - planned
  - Explanation - as needed
- Monitoring:
  - Academic observation
  - Academic questioning
- Feedback:
  - Academic feedback

Procedural

- Presentation:
  - Structured/direct instruction
  - Explanation
- Feedback:
  - Task engagement feedback
  - Evaluation feedback

Description of Behaviors

Handout
IO - 5

Generate examples for each of the following situations:

- The teacher looks at or listens to an academic response.

- The teacher asks the student for written or oral answers.

- The teacher tells the student whether the answer is right/ is wrong.

- The teacher states the goals of instruction or gives directions about the procedures and activities the student should carry out.

Teacher Contact-Substantive

Teacher Contact with Computer-using Students

Substantive

Presentation:

- Explanation before computer use
- Explanation during computer use as needed

Monitoring:

- Academic observation during computer use
- Academic questioning during computer use

Feedback:

- Academic feedback during and after computer use
- Behavioral reinforcement

Teacher Contact-Procedural

Teacher Contact with Computer-using Students

Procedural

Presentation:

- Structured /direct instruction
- Explanation

Feedback:

- Task engagement feedback
- Evaluation feedback

Objective

OBJECTIVE

To evaluate the effectiveness of using computers for instruction

Student Observations

Observations of Students

- Body language
- Methods of obtaining answers
- Actions and reactions
- Willingness/refusal to work
- Engagement in activities
- Interaction with peers
- On-task behavior
- Responses - verbal and written

Teacher-Controlled Variables

Teacher-Controlled Variables

- **Communication of expectations**
- **Establishment of rules and procedures for behavior and academic activities**
- **Appropriate room arrangements**
- **Consistent organization and procedures**

Remember

Remember to be Flexible and:

If it doesn't work for you...
change it...
and keep on changing...
until
you have a system that
works for you!

Workshop Evaluation

Instructional Organization
Module 4

Handout
IO - 5

Title of Module (Session): ______________________________

Location: ______________________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by________________________I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 **Poor**

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 **Vague**

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 **Dull**

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 **Inadequate**

5. The presentation was:

Excellent 1 2 3 4 5 **Poor**

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 **No Benefit**

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 **Poor**

MODULE

5

TEACHER STRATEGIES FOR MONITORING PROGRESS

SET-2: INSTRUCTION
Monitoring Progress

Teacher Strategies for Monitoring Progress

There should be consistent monitoring of student progress during the use of technology.

INTRODUCTION: This module is intended to empower workshop participants in planning the use of CAI for instructing students with mild handicaps by providing them with strategies for monitoring student progress. The module is composed of Instructor Notes, with:

(A) Participant Handouts
(B) Transparencies
(C) A Workshop Evaluation Form

TIME REQUIRED: 75 to 90 minutes.

TARGET AUDIENCE: Building change facilitators, special and regular education teachers of students with mild handicapping conditions.

PARTICIPANT REQUIREMENTS:

A. Participation in workshop activities and discussion.
B. Interest and willingness to learn how to use strategies for monitoring student progress.
C. Interest and willingness to practice strategies for monitoring student progress.

Module 5

Teacher Strategies for Monitoring Progress

Introduction: This session will be provide participants with an overview of strategies for accessing performance records in CAI to monitor student progress. The **focus** will be the assessment procedures routinely used for monitoring student progress. The routine procedures teachers **practice** include assessing students' classwork, tests, homework, and participation. **Readiness** for using the performance features of CAI is based upon the assumption of already existing assessment procedures. Monitoring student performance on CAI is essential for effectively using CAI.

Monitoring Progress

SHOW: Transparency 1.

REFER TO: Handout 1.

Handout TS - 1

Participant Survey Form

Monitoring Progress

SHOW: Transparency 2.

OBJECTIVES

- *Describe the functions of objectives*
- *Identify the features of software for monitoring student progress*
- *Determine appropriate uses of features of CAI for monitoring progress*
- *Access student performance records*
- *Use performance information for grading, evaluating, and future planning of instruction*

READ: To determine the effectiveness of instruction there must be a way of providing evidence that learning has taken place. Administrators look for evidence of learning when evaluating teachers in the classroom. Research has shown that effective schools are characterized as having systematic and consistent procedures for monitoring and assessing student progress. Teachers routinely monitor student progress toward academic achievement using a variety of assessment and/or evaluation procedures. Monitoring progress is necessary to substantiate that learning is occurring. It provides a means for teachers to produce evidence that their teaching is effective and that students are learning.

DISCUSS: Methods currently used for monitoring student progress. Responses should include classwork, homework, tests (teacher-made and standardized), and participation.

READ: The first step involved in monitoring student progress is to develop the instructional objective.

Monitoring Progress

SHOW: Transparency 3.

Functions of Objectives

- ***To provide evidence that learning took place***
- ***To focus lesson planning upon appropriate conditions for learning***
- ***To guide the development of a measure of the learners' performance***
- ***To assist learners in their efforts to learn***

READ: Instructional objectives have particular functions for organizing the concepts and skills to be learned. The functions include providing evidence that learning took place, focusing the lesson planning upon the methods, materials, and delivery of instruction conducive to learning so that the instruction will be maximized, guiding development of a measure of the learners' performance, and finally assisting learners in their efforts to learn. For students with mild handicaps, particular considerations need to be made to ensure that instruction is appropriate. Student progress should be used as a guide for planning instruction so that performance measures learning. Another function of objectives is to establish performance measurement methods. The criteria set in the objective can be used to provide a standard by which to measure the learner's progress. The information available from measurement can then be used to assist learners in their efforts to learn. Students are able to identify the concepts and skills they have mastered as well as the ones requiring more practice. A final function of objectives is to inform students of what they can expect to learn from a particular instructional activity. They may assess their own performance to determine if they have met the criterion for mastery. Their own assessment can stimulate a sense of accomplishment and success or present a challenge to put forth more effort to achieve.

Monitoring Progress

SHOW: Transparency 4.

Components of an Objective

- ***A measurable behavior***
- ***Conditions of performance***
- ***Materials and mode***
- ***Criterion for achievement***

READ: An objective should include specific components. The components are essential for an objective to function as an effective means of monitoring progress. Once the objective is identified, and materials and media are selected, the instruction can be delivered. Performance is then elicited from the student. Student performance is observed to evaluate the learning and the effectiveness of the instruction. Criterion for achievement can be set by specifying accuracy, fluency, rate, duration, or other dimensions of the student's performance.

ASK: What are ways in which teachers evaluate student performance? Responses should include: Questioning (written and oral), watching, providing feedback, guiding inquiry, and assessing competencies.

Monitoring Progress

SHOW: Transparency 5.

Steps for Evaluating Progress

1. ***Identify instructional objectives***
2. ***Collect performance data***
3. ***Determine progress***
4. ***Plan future instruction***

READ: Evaluating student progress in computer use involves a series of steps. These steps are similar to routine methods for evaluating progress toward achievement of any academic objectives. Performance information is quantified and recorded. The most current performance is compared to previous data to determine progress toward meeting the objectives. Based on the data, teachers can make instructional decisions in planning future instruction. Plans

may include providing instruction which challenges the student, or providing remedial instruction which involves reteaching. Typically, CAI is designed with data collection features which record student responses. Therefore, technology enables teachers to make instructional decisions based on performance records available in CAI. The performance records may be used for monitoring progress. Teachers may hold students accountable for work completed at the computer.

SHOW: Transparency 6.

OBJECTIVE

Identify the software features for monitoring student progress.

READ: Software may be designed with a variety of features which collect data regarding student performance. Computers have the capacity to record input from users. Student responses to the questions appearing in the program can be judged for accuracy according to the specifications of the program. A variety of methods are employed to report the accuracy of student responses.

ASK: What performance information is reported? Responses should include accuracy, score, number missed, questions missed, level achieved, high point, etc.

SHOW: Transparency 7.

Software Features for Monitoring Student Progress

- ***Performance tracking and reporting***
- ***Challenge for high score competition with peer or computer***
- ***Branching to appropriate skill levels***
- ***Informative feedback, demonstration, example, and/or review options***
- ***Final report of mastery and/or areas needing more practice***
- ***Print-out of performance summary***

READ: Many instructional computer programs are designed to collect and record performance data based on student input, particularly drill and practice software. Performance summary records are available for both teacher and student use.

ASK: What information can be obtained from performance records? Responses should include total correct, incorrect, percent accuracy, game scores, high point, etc. A game format may provide challenge for students to beat the computer, to attain a high score, or to compete with a peer.

READ: Some instructional programs provide branching to alternate levels of the program. The program may automatically advance a student to an incremental level of difficulty if performance indicates a mastery of the skill presented in a current program. Likewise, the program may place the student in a remedial branch if performance indicates difficulty with the skill required for a particular program.

Feedback may be in the form of computer-generated graphics, sound effects, speech, or textual messages. Feedback may occur after both correct and incorrect answers. Incorrect answer feedback may provide information to help the student make a more accurate response. It may include a hint, demonstration, or example from which the student may derive the correct answer.

ASK: What are the types and functions of feedback? Responses should include information regarding the accuracy of student responses.

READ: Many software programs provide final reports which may indicate the total correct or incorrect; whether criteria for mastery were met; and perhaps areas needing more practice. Some software programs have the capacity to printout summary reports for an individual student or for several students at once. Printed reports facilitate the consistent monitoring of student progress toward the attainment of instructional goals.

Monitoring
Progress

SHOW: Transparency 8.

OBJECTIVE

Determine appropriate uses of software features for monitoring progress.

READ: The performance information provided in CAI can be very useful for monitoring student progress. Using the performance information requires planning CAI activities which lead toward achievement of further instructional objectives.

Monitoring Progress

SHOW: Transparency 9.

Uses of CAI Features

- ***Provide assessment information for grading and evaluation***
- ***Determine students' progress toward mastery***
- ***Identify students' strengths and weaknesses***
- ***Branch instruction to appropriate level of instruction***
- ***Provide performance summaries and/or diagnostic assessment information***

READ: Recording student performance for classwork and homework assignments, tests, and class participation is typically involved in assessing academic progress toward achieving instructional objectives. The recorded data can be used for evaluating the effectiveness of CAI activities, planning further instruction, and assessing student progress.

ASK: How can the availability of CAI performance information be included in grading and evaluation of student's academic performance? Responses should include crediting students with accomplishments using CAI, as well as holding students accountable for their achievement.

READ: Recording game scores for several sessions may be useful in determining progress toward mastery of specific skills. Game format CAI often requires increasingly challenging skills as students progress through the mastery levels of the program. Ongoing records of performance may be useful for determining strengths and weaknesses in particular skill areas.

ASK: What are the benefits of CAI programs with branching capabilities? Responses should include that there is a greater potential for CAI to be more appropriate by branching to alternate levels based on the student's responses.

READ: Printouts of performance summaries provide permanent records of assessment and diagnostic information.

ASK: What types of assessment/diagnostic information may be provided in the performance summary? Responses should include records of skill areas where mastery has been achieved or where more practice is needed. How can this information be used?

Monitoring Progress

SHOW: Transparency 10.

OBJECTIVE

Access student performance records

READ: Often CAI will include teacher options for accessing performance information.

Monitoring Progress

SHOW: Transparency 11.

Performance Summary Information

- *Student name*
- *Program name*
- *Level of program*
- *Number of trials*
- *Number correct*
- *Mastery achieved*
- *Areas needing more practice*

READ: Performance records may include: information regarding the program the student used; the level; the number of questions tried; the number correct; whether the mastery level of performance was achieved; and perhaps, areas needing more practice. The teacher may need to record the information regarding mastery or areas needing further practice for making decisions for planning future CAI activities.

ASK: What other information may be needed for evaluating performance? The CAI should be an integral part of information used for evaluation, but not the exclusive source for determining progress or mastery. Discuss other ways of obtaining performance information and how it would relate to the performance on CAI.

Monitoring Progress

SHOW: Transparency 12.

OBJECTIVE

Use performance information for grading, evaluating, and future planning of instruction.

READ: Performance records from CAI provide a means for holding students accountable for their work at the computer as well as giving them credit. The work at the computer should be considered an integral part of the instruction developed for individual objectives. Progress toward objectives should be monitored and evaluated by recording performance information even if the software does not provide performance records. CAI should be assigned for meeting specific instructional goals either as practice or challenge.

ASK: How is performance information helpful for planning instruction? Responses should include that student performance provides information for deciding what, when, and how to teach particular concepts and skills.

HANDS-ON ACTIVITIES: Suggested Software: MECC Mastering Math Series. Look at performance features in the student lesson. Then use "Teacher Options" to obtain additional performance information which can be useful for future planning.

ASK: How can teachers use this information for planning, evaluating, and grading student performance toward meeting instructional objectives?

DEMONSTRATION: Software Suggested: MECC Grade Manager Simulation of a grade book.

ASK: How are features of electronic gradebooks similar to conventional gradebooks? What are the advantages of having the gradebook on the computer? How are electronic gradebooks useful for monitoring student progress?

HANDS-ON ACTIVITIES: Software suggested: MECC Lunar Laboratory and MECC Market Place. Look at performance features.

ASK: How can student progress be monitored with problem-solving software? What would be the objective? What records of student responses are available? What summary information is available? How can teachers determine progress toward meeting objectives? How can information be used for future planning of integrated instruction?

Handout
TS - 2

REFER TO: Handout 2.

Student: ____________________

Software: ____________________

Objective: ____________________

Performance information: ____________________
____

Accomplishments: ____________________
____

Future instructional needs: ____________________
____
____
____

Handout
TS - 3

EVALUATION

Have participants complete Evaluation Form in handout packet. End of Session.

Introduction

Please complete
Handout 1
participant survey form.
(If you have not already done so.)

Thank you!

Participant Survey

Monitoring Progress
Module 5

Handout
TS - 1

Name:______________________ District:______________________

Address:______________________ Telephone:______________________

School or Office:______________________ Grade Level:______________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:______________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1 — 2 — 3 — 4 — 5

(beginner) (competent/comfortable) (expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer?	**YES**	**NO**
3. Can you obtain further access by using a computer lab?	**YES**	**NO**
4. Do you know how to use many published software products?	**YES**	**NO**
5. Have you used a wide range of published software in your classroom?	**YES**	**NO**
6. Have you integrated many published software products into your:		
• weekly instructional plan?	**YES**	**NO**
• daily lesson plan?	**YES**	**NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products?	**YES**	**NO**

OBJECTIVES

- Describe the functions of objectives.
- Identify the software features for monitoring student progress.
- Determine appropriate uses of features of CAI for monitoring progress.
- Access student performance records.
- Use performance records for grading, evaluating, and future planning of instruction.

Functions of Objectives

Functions of Objectives

- To provide evidence that learning took place
- To focus lesson planning upon appropriate conditions for learning
- To guide the development of a measure of the learners' performance
- To assist learners in their efforts to learn

Components of an Objective

Components of an Objective

- A measurable behavior
- Conditions of performance
- Materials and mode
- Criterion for achievement

Steps for Evaluating Progress

Steps for Evaluating Progress

1. Identify instructional objectives

2. Collect performance data

3. Determine progress

4. Plan future instruction

Objective

OBJECTIVE

Identify the software features for monitoring student progress.

Software Features

Software Features for Monitoring Student Progress

- Performance tracking and reporting.
- Challenge for high score competition with peer or computer.
- Branching to appropriate skill levels.
- Informative feedback, demonstration, example, and/or review options.
- Final report of mastery and/or areas needing more practice.
- Print-out of performance summary.

Objective

OBJECTIVE

Determine appropriate uses of software features for monitoring progress.

Uses of CAI Features

- Provide assessment information for grading and evaluation
- Determine students' progress toward mastery
- Identify students' strengths and weaknesses
- Branching instruction to appropriate level of instruction
- Provide performance summaries and/or diagnostic assessment information

Objective

OBJECTIVE

Access student performance records.

Performance Summary Information

- Student Name
- Program Name
- Level of Program
- Number of Trials
- Number Correct
- Mastery Achieved
- Areas Needing More Practice

BEST COPY AVAILABLE

Objective

OBJECTIVE

Use performance information for grading, evaluating, and future planning of instruction.

Monitoring Student Progress

Monitoring Progress
Module 5

Handout
TS - 2

Student:

Software:

Objective:

Performance information:

Accomplishments:

Future instructional needs:

Workshop Evaluation

Monitoring Progress
Module 5

Handout
TS - 3

Title of Module (Session): ____

Location: ____

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by______________________ I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 **Poor**

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 **Vague**

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 **Dull**

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 **Inadequate**

5. The presentation was:

Excellent 1 2 3 4 5 **Poor**

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 **No Benefit**

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 **Poor**

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MODULE

6

STUDENT STRATEGIES FOR MONITORING PROGRESS

Self-Monitoring Strategies for Students

Students should receive training in strategies for self-monitoring progress with CAI.

INTRODUCTION: This module is intended to empower workshop participants by providing them with strategies for teaching students to use self-monitoring strategies with CAI. The module is composed of Instructor Notes, with:

(A) Participant Handouts
(B) Transparencies
(C) A Workshop Evaluation Form

TIME REQUIRED: 75 to 90 minutes.

TARGET AUDIENCE: Building change facilitators, special and regular education teachers of students with mild handicaps.

PARTICIPANT REQUIREMENTS:

A. Interest and willingness to learn how to use self-monitoring strategies.
B. Participation in workshop activities and discussion.
C. Interest and willingness to help students practice self-monitoring strategies.

Module 6

Self-monitoring Strategies for Students

Introduction: This session will provide participants with an overview of strategies for training students to self-monitor their own progress using CAI. The **focus** will be techniques for students to self-monitor their progress using "help" features, feedback, and performance information provided in the software. Existing instructional techniques **practiced** by teachers include provision of feedback, assistance, and performance information indicative of progress. **Readiness** for self-monitoring progress using CAI is based on the teachers' recognition that learning is enhanced by students' knowledge of progress in non-CAI activities.

READ: This module is intended to give workshop participants guidelines for teaching students to monitor their own progress using CAI. Strategies will be demonstrated for both teacher and student use which will enable students to be successful with CAI. Materials will be presented for instructing students in self-monitoring their own learning.

Monitoring Progress

SHOW: Transparency 1.

REFER TO: Handout 1.

Handout SS - 1

Participant Survey Form

Monitoring Progress

SHOW: Transparency 2.

OBJECTIVES

- ***Identify strategies for enabling students to self-monitor their progress when using the computer.***

(objectives continued...)

- ***Determine the uses of cue cards to help students succeed with CAI.***
- ***Train students to access "help" information provided in CAI.***
- ***Provide students with assistance in determining the functions of feedback.***
- ***Train students to access and self-record performance on CAI.***

READ: Teachers often assign computer activities as independent learning tasks without direct teacher supervision. The computer has the capacity to determine the accuracy of responses and to provide immediate feedback. The computer may also provide access to information which will help the student arrive at correct answers, thereby enhancing instruction. A summative performance report is typically available in CAI. Even though these features may be inherent in the software, teachers may need to employ specific strategies for the effective utilization of CAI with students. These strategies include training students to use features of software and to chart their own progress.

Monitoring
Progress

SHOW: Transparency 3.

REVIEW: Purposes of Academic Monitoring

- ***Attainment of student goals***
- ***Improvement of instructional practices***

ASK: How do teachers provide access to assistance, feedback, and performance information in non-CAI instruction? What are the functions of assistance, feedback and performance reports for students to attain instructional goals?

READ: Since students work independently at the computer, it is important that teachers train students to self-monitor their achievement when using the computer rather than relying on the teacher.

Monitoring Progress

SHOW: Transparency 4.

Strategies for the Teacher

- ***Set purposes for CAI activity***
- ***Train students in strategies for success***
- ***Demonstrate uses of features of program which enhance learning***
- ***Arrange for cooperative learning opportunities***
- ***Hold students accountable for work***
- ***Record performance scores for use in student evaluation***
- ***Use performance information for communication with students and parents***

READ: Teachers should inform students of the purpose of the CAI and how the activity relates to instructional objectives. Information may need to be provided for how the CAI is linked to other instructional activities. Teachers may need to train students in strategies for independently working at the computer to insure that learning takes place.

DISCUSS: Examples of strategies that teachers use to help students work independently. Responses may include: provide explanations and demonstrations of features within specific software programs; provide cue cards; make grouping arrangements which provide opportunities for students to work together.

READ: Students should be held accountable for their work at the computer. The computer is an instructional activity which should be related to the curriculum and objectives. The instructional time should be spent in activities which move the student toward meeting these objectives. Evidence that progress is being made may be tracked by students charting their own performance. Teachers may also use the performance information for communicating progress toward objectives with parents and students.

Monitoring Progress

SHOW: Transparency 5.

Set Purposes for CAI Activity

- ***Determine how CAI contributes toward achieving instructional goals.***
- ***Inform students of objective, expectations, and task.***
- ***Monitor progress toward instructional goals.***

READ: In non-CAI activities students are provided with a series of various instructional activities related to specific curriculum units. The introduction of assignments includes an explanation of the purpose of the assignment related to the instructional objective. A similar introduction is helpful for CAI assignments. The student should be informed of what performance is expected and how the teacher will monitor his progress. He should be informed that the CAI activity is an important assignment and will be counted as part of his grade.

ASK: How can teachers convey to students the purpose of a CAI assignment?

Monitoring Progress

SHOW: Transparency 6.

Strategies for Success

- ***Goal setting:*** *How well can I do?*
- ***Following instructions:*** *What am I supposed to do?*
- ***Accessing information:*** *How can I do it?*
- ***Evaluating performance:*** *How well did I do?*

READ: Teachers need to convey to students strategies for being successful in any academic activity. Instruction may include metacognitive strategy training involving self-questioning. Questions, such as the ones suggested as strategies for success, may be customized for specific software and students. Self-questioning procedures provide a focus for an appropriate approach to accomplish the CAI tasks.

ASK: What are ways that teachers provide students with strategies for successful learning? How can these strategies be applied to CAI?

Monitoring Progress

SHOW: Transparency 7.

Elements of Effective Instruction
Build Toward Personalized Instruction
Which Maximizes Student Success

- ***Immediate instructive feedback***
- ***Access to assistance***
- ***Sequential presentation***
- ***Questions presented one at a time***

READ: CAI features may provide elements of effective instruction. Good software, particularly drill and practice, is designed to include elements of effective instruction. Maximizing the effectiveness of these features may require support from the teacher through training students to use the instructional features of the software.

Monitoring Progress

SHOW: Transparency 8.

OBJECTIVE

- ***Determine the use of cue cards to help students succeed with CAI***

READ: Teachers need to train students in the use of cue cards which may facilitate learning when engaged in CAI activities. The information provided in cue cards may be software specific information regarding the appropriate key presses to access various parts of the program. Cue cards may also provide process information such as the appropriate steps to arrive at correct answers or solutions. The most frequently asked questions may provide a guideline for determining the appropriate information to include on cue cards. Having the information available easily would, perhaps, increase the student's ability to work independently and reduce the reliance on the teacher or others regarding how to proceed with the CAI activity.

DISCUSS: Examples of information to be included on cue cards that would benefit students. What would the impact of the effective use of cue cards be on: classroom management; independent learning; and progress toward curriculum objectives?

Monitoring Progress

SHOW: Transparency 9.

OBJECTIVE

Train students to access "help" information provided in CAI.

READ: Software often provides assistance, or on-line help, to the student for accomplishing specific tasks required by the program. For example, vocabulary assistance may be available to pronounce and define unknown words, or a calculator may be accessed for mathematical computation.

ASK: What are other examples of on-line help encountered in software in the classroom? What training would the students need for accessing these features of the program?

Monitoring Progress

SHOW: Transparency 10.

OBJECTIVE

Provide students with assistance in determining the functions of feedback.

READ: Directions for students may need to include instruction in the functions of feedback. Typically, knowledge that a correct answer has been given is straight forward, but often the incorrect answer feedback can be confusing. The teacher should determine how the feedback can be useful information to the student for obtaining the correct answer. For some students it may not be obvious that their answer is incorrect. Therefore, the teacher must explain how the program works regarding incorrect answers. Students may need instruction in appropriate strategies for evaluating their incorrect answers and coming up with alternate solutions. This procedure may be new to some students who are not accustomed to being required to correct their own work.

ASK: What are other examples of feedback in software that may need to be explained to students for more effective use of CAI?

Monitoring Progress

SHOW: Transparency 11.

OBJECTIVE

Train students to access and self-record performance on CAI.

READ: Students can be trained to access the summary performance records provide in CAI, or to monitor performance information as it appears in the program. Teachers may find it helpful to train students in procedures for self-recording the performance information. The information may be used by the student for self-evaluating progress toward a specific instructional goal or for setting new goals.

Monitoring Progress

Handout
SS - 2

SHOW: Transparency 12.

REFER TO: Handout 2.

Student Progress Chart

READ: Teachers may prepare a chart for the students to record their performance. Students will be able to see their progress as the scores are filled in.

Monitoring Progress

SHOW: Transparency 13.

REFER TO: Handout 3.

Handout SS - 3

Student Performance Chart

READ: A chart for recording goals, as well as scores, may be prepared for students to use in self-evaluating progress. Teachers should instruct students in procedures for setting goals and evaluating progress as they use the chart to record the scores.

ASK: How can teachers set up procedures for students to self-record their own performance? What must be done to insure effective self-recording?

READ: Students may be trained to maximize learning and monitor progress toward achievement by using these strategies. Teachers will need to plan instruction which includes directions for each of these strategies in the particular software the student is using. The format for directions, "help" features, and performance records is unique for each piece of software. Even different programs on the same disk may require an explanation of how to use the various features for monitoring progress.

Handout SS - 4

DEMONSTRATE: Software for Applying Student Self-monitoring Strategies.

REFER TO: Handout 4.

Use the form as a guide for previewing software for student self-monitoring:

Name of Software:
Publisher:
Curriculum and Objective:
Cue Cards:
"Help":
Feedback:
Performance information:

Handout SS - 5

EVALUATION

Have participants complete evaluation form contained in handout packet. End of Session.

Introduction

Please Complete

Handout 1

Participant Survey

(if you have not already done so)

Thank you!

Participant Survey

Monitoring Progress
Module 6

Handout
SS - 1

Name:______________________ District:______________________

Address:______________________ Telephone:______________________

School or Office:______________________ Grade Level:______________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:______________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1 2 3 4 5

(beginner) (competent/comfortable) (expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

   100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer? **YES** **NO**
3. Can you obtain further access by using a computer lab? **YES** **NO**
4. Do you know how to use many published software products? **YES** **NO**
5. Have you used a wide range of published software in your classroom? **YES** **NO**
6. Have you integrated many published software products into your:
   - weekly instructional plan? **YES** **NO**
   - daily lesson plan? **YES** **NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products? **YES** **NO**

Objectives

OBJECTIVES

- Identify strategies for enabling students to self-monitor their progress when using the computer.
- Determine the uses for cue cards to help students succeed with CAI.
- Train students to access "help" information provided in CAI.
- Provide students with assistance in determining the functions of feedback.
- Train students to access and self-record performance on CAI.

PURPOSES OF ACADEMIC MONITORING

- Attainment of Student Goals
- Improvement of Instructional Practices

Strategies For the Teacher

Strategies For the Teacher

- Set purposes for CAI activity
- Train students in strategies for success
- Demonstrate uses of features of program which enhance learning
- Arrange for cooperative learning opportunities
- Hold students accountable for work
- Record performance scores for use in student evaluation
- Use performance information for communication with students and parents

SET PURPOSES FOR CAI ACTIVITY

- Determine how CAI contributes toward achieving instructional goals
- Inform students of objective, expectations, and task
- Monitor progress toward instructional goals

Strategies For Success

Goal-setting:
How well can I do?

Following Instructions:
What am I supposed to do?

Accessing Information:
How can I do it?

Evaluating Performance:
How well did I do?

ELEMENTS OF EFFECTIVE INSTRUCTION

Build Toward Personalized Instruction Which Maximizes Student Success

- Immediate instructive feedback
- Access to assistance
- Sequential presentation
- Questions presented one at a time

Objective

OBJECTIVE

Determine the use of cue cards to help students succeed with CAI

Objective

OBJECTIVE

Train students to access "help" information provided in CAI

OBJECTIVE

Provide students with assistance in determining the functions of feedback

OBJECTIVE

Train students to access and self-record performance on CAI

STUDENT PROGRESS CHART

NAME________________________ PROGRAM________________________

Monitoring Progress
Module 6
T-12

Handout
SS - 2

DATE	GAME	SCORE

STUDENT PERFORMANCE CHART

NAME ______________________ PROGRAM ______________________

Monitoring
Progress
Module 6
T-13

Handout
SS - 3

GOAL		RESULTS
100%		
90%		
80%		
70%		
60%		
50%		
40%		
30%		
20%		
10%		

Lesson Name:
____

GOAL		RESULTS
100%		
90%		
80%		
70%		
60%		
50%		
40%		
30%		
20%		
10%		

Lesson Name:
____

GOAL		RESULTS
100%		
90%		
80%		
70%		
60%		
50%		
40%		
30%		
20%		
10%		

Lesson Name:
____

√ - check the goal in adjacent box.

Guide For Previewing Software

Handout
SS -4

Name of Software:

Publisher:

Curriculum and Objective:

Cue Cards:

"Help":

Feedback:

Performance Information:

Workshop Evaluation

Monitoring Progress
Module 6

Handout
SS - 5

Title of Module (Session): ______________________________

Location: ______________________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by______________________I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent **1** **2** **3** **4** **5** **Poor**

2. The objectives of the module were:

Clearly Evident **1** **2** **3** **4** **5** **Vague**

3. The ideas and activities presented were:

Interesting **1** **2** **3** **4** **5** **Dull**

4. The scope (coverage) of the topic was:

Adequate **1** **2** **3** **4** **5** **Inadequate**

5. The presentation was:

Excellent **1** **2** **3** **4** **5** **Poor**

6. My attendance at this workshop should prove:

Beneficial **1** **2** **3** **4** **5** **No Benefit**

7. Overall, I consider this workshop:

Excellent **1** **2** **3** **4** **5** **Poor**

Appendix D

Set 3 - Support and Evaluation Modules
Teachers' Technology Resource Guide

SET-3
SUPPORT MODULE

SUPPORT

Human Resources & Material Resources

Teachers' efforts to integrate technology must be supported.

INTRODUCTION: This module empowers participants with strategies for supporting teachers who are implementing TIE's Twelve Essentials for integrating technology into instruction. The module is composed of Instructors Notes, with:

(A) Participant Handouts
(B) Transparencies
(C) A Workshop Evaluation Form

Time required: 75 minutes

TARGET AUDIENCE: Building and district support personnel who are helping teachers integrate technology into their instruction.

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Support

Human Resources & Material Resources

Support

Handout
S - 1

SHOW: Transparency 1. *Participant Survey Form*

REFER TO: Handout 1.

READ: TIE is an educational innovation designed to "tie" technology to the existing program of instruction. Any innovation with such a complex goal places significant demands on teachers. Teachers cannot accommodate all of those demands on their own. They can benefit from support which addresses a variety of concerns that focus on what they must do in the classroom. Other concerns, such as how access to shared technology should be organized, go beyond the classroom and should be addressed at levels beyond the classroom to include building level administrators and staff (i.e. principal, assistant principals, librarians, media specialists, etc.).

Support

SHOW: Transparency 2.

OBJECTIVES

- *To understand the change process of technology integration*
- *To understand the Twelve Facilitation Support Strategies*

READ: The first objective refers to the process of educational change. The complexity of educational change is often underestimated. There are a number of functional models of educational change. Providing workshops typically does not assure the classroom level implementation of the needed instructional strategies. Asking teachers to change their behavior, to add something to their repetoire is a tall order.

Support

SHOW: Transparency 3.

Teachers' efforts to integrate technology must be supported if they are going to successfully respond to this demand.

Handout
S - 2

REFER TO: Handout 2.

The Three Basic Organizing Ideas of CBAM

A) The individual's attitudes and concerns about the innovation

B) The individual's level of sophistication in using the innovations strategies;

C) The actual components of the innovation and the forms that those components can assume.

READ: TIE incorporates a particular model of educational change, the Concerns-Based Adoption Model, CBAM. CBAM provides a means for dealing with educational change. It provides three basic organizing ideas with associated evaluation measure.

Support

SHOW: Transparency 4.

Objective

To understand the Twelve Facilitation Support Strategies

Support

SHOW: Transparency 5.

The Twelve Facilitation Support Strategies

1. ***Adding and linking resources***
2. ***Helping teachers understand the possibilities***
3. ***Providing specific staff development sessions***
4. ***Consulting and collaborative problem solving***
5. ***Organizing the technology***
6. ***Giving solutions***
7. ***Providing technical assistance***
8. ***Providing models and demonstration***
9. ***Energizing and motivating***
10. ***Developing support structures***
11. ***Supporting the teacher emotionally***
12. ***Monitoring and evaluating***

READ AND DISCUSS: The Twelve Facilitation Support Strategies.

1. Adding and linking resources. Teachers are often looking for more computer time, more software and more associated supplies. With regard to software, it is reasonable for teachers to want easy access. Whether the software is delivered via a network, on a hard drive, or available on disks, teachers want that software up on the screen. If delivered via a network complicated multiple-step commands must be avoided. If available on disk, teachers are much happier if they have at least one copy they can call their own. For example, when teachers are working to write their plans, preview, select, or modify software and link the use of that software to other instructional activities they do not want to have to struggle to find the software (whether it is on a network or disk). They want the software up and running on the computer. In addition, it is obviously easier for teachers to plan for the use of specific software when it is convenient, preferably in their own building, if not their own classroom.

Access to software review guides and information about using technology can be a very helpful resource for supporting teachers in planning to implement the use of technology in the classroom. The Teachers' Technology Resource Guide can be used as a reference for locating various organizations which produce support materials.

Handout
S - 3

REFER TO: Handout 3.

Support Strategy Scenarios and Activities

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 1.

READ AND DISCUSS:

2. Helping teachers understand the possibilities. There is a broad array of possible ways to use the computer. Even with a clear focus on the priority of curriculum correspondence, it is possible to use different types of software programs (tools, drill and practice, tutorials, simulations) in different curriculum areas. While it is helpful for teachers to be aware of many possibilities, they should to encouraged to focus on some possibilities that are of interest to them and viable in their situation.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 2.

READ AND DISCUSS:

3. Providing specific staff development sessions. In addition to the sessions that are organized around the six modules associated with instruction, it may be useful to arrange informal sessions around issues such as the one reviewed in the above discussion on helping teachers understand the possibilities.

4. Consulting and collaborative problem solving. The above scenario or an alternate generated by the group may require some collaborative problem solving involving the fifth and sixth grade teachers mentioned above and the person in the support role. The two first grade teachers would also benefit from some collaborative problem solving, but it is more likely that they could make progress in their efforts to group students according to social and classroom factors by posting/sharing the schedule indicating the time, grouping, and software without involving otherteachers or those in the support role.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 4.

READ AND DISCUSS:

5. Organizing the technology. Hardware and software for classroom use must be organized in a way that makes it accessible. The logic of the organization of technology should be matched to the ways in which it is used. Factors such as security, although important, should not take precedence over ease of access and availability for teachers.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 5.

READ AND DISCUSS:

6. Giving solutions. There are often benefits to mutually formulated solutions derived from consultation and collaborative problem solving. At other times support persons need to be more directive and offer solutions that they know can work in certain situations.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 6.

READ AND DISCUSS:

7. Providing technical assistance. While support personnel need not be technical experts, they should have some working knowledge of the technical aspects of technology. It is preferred that they have some experience of more commonly encountered computer problems, as well as ability to act as troubleshooters.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 7.

READ AND DISCUSS:

8. Providing models and demonstration. Modeling and demonstrating provide valuable learning opportunities. The models must, however, be relevant to the needs and concerns of the teachers.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 8.

READ AND DISCUSS:

9. Energizing and motivating. All of us can benefit from some encouragement and additional incentives. Support personnel should, themselves, be excited and should provide some inspiration for others.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 9.

READ AND DISCUSS:

10. Developing support structures. Technology support structures will be more helpful if they are sustained, and become integrated into existing support structures.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 10.

READ AND DISCUSS:

11. Supporting the teacher emotionally. Support personnel should encourage and reinforce the teacher. Working to integrate technology can be an overwhelming task. Teachers need kind words of encouragement if intimidated, frustrated or disappointed with the lack of progress.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 11.

READ AND DISCUSS:

12. Monitoring and evaluating. The provision of feedback on implementation progress is crucial. Critical or judgemental evaluation is inappropriate and not helpful. Teachers need insightful feedback that is responsive to their concerns.

Handout
S - 3

REFER TO: Handout 3.

GROUP DISCUSSION: Participants discuss Scenario and Activity for Support Strategy 12.

READ SUMMARY: Teachers must receive support if they are going to successfully respond to this or any similar demand. Virtually every innovation or program development effort includes the provision of specific staff development sessions. However, typically much more is needed. Consulting and collaborative problem solving are particularly important.

Handout
S - 4

EVALUATION:

End of Session. Conduct evaluation through question and answer session and have participants fill out Evaluation Form.

Please Complete

Handout #1

Participant Survey

(If you have not already done so)

Thank You!

Participant Survey

Support Module

Handout
S - 1

Name:________________________ District:________________________

Address:________________________ Telephone:________________________

School or Office:________________________ Grade Level:________________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:________________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1	2	3	4	5
(beginner)		(competent/comfortable)		(expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer?	**YES**	**NO**
3. Can you obtain further access by using a computer lab?	**YES**	**NO**
4. Do you know how to use many published software products?	**YES**	**NO**
5. Have you used a wide range of published software in your classroom?	**YES**	**NO**
6. Have you integrated many published software products into your:		
• weekly instructional plan?	**YES**	**NO**
• daily lesson plan?	**YES**	**NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products?	**YES**	**NO**

OBJECTIVES

- To understand the change process of technology integration
- To understand the Twelve Facilitation Support Strategies

The Need for Support

Teachers' efforts to integrate technology must be supported if they are going to successfully respond to this demand.

OBJECTIVE

To Understand
the Twelve Facilitation
Support Strategies

The 12 Facilitation Support Strategies

1. Adding and linking resources
2. Helping teachers understand the possibilities
3. Providing specific staff development sessions
4. Consulting and Collaborative Problem Solving
5. Organizing the technology
6. Giving solutions
7. Providing technical assistance
8. Providing models and demonstration
9. Energizing and motivating
10. Developing support structures
11. Supporting the teacher emotionally
12. Monitoring and evaluating

Handout
S - 2

CBAM's THREE BASIC ORGANIZING IDEAS

A) The individual's attitudes and concerns about the innovation:
Stages of Concern: SoC

B) The individual's level of sophistication in using the innovations strategies:
Levels of Use: LoU

C) The actual components of the innovation and the forms that those components can assume:
Innovation Configuration: IC

(A) The SoC describes seven types of concerns that individuals experience as they proceed through the change process. These range from early concerns about "self," to concerns about "task," and finally to concerns about "impact".

(B) The LoU describes how an individual's performance changes as s/he becomes more familiar with an innovation and more skillful at using it. Levels of Use focuses on whether or not and how the educator is using an innovation. Eight distinct Levels of Use have been identified. Typically an individual begins with LoU 0 ("non-use" of the innovation), then moves to LoU I "orientation" about the innovation and LoU II "preparation" for use. Initial use is typically at LoU III "mechanical," but as experience increases, innovation users progress to LoU IVA "routine" level of use and eventually may reach the higher levels, (LoU IVB, V, and VI), where changes are made based on formal or informal assessments of student needs.

(C) The IC describes the various operational forms of an innovation that result as individual users adapt it for use in their particular setting. With this concept, the major operational components of an innovation are identified, and ways that each of the components can vary are described. Summary descriptions are provided on the Innovation Configuration Component Checklist. The IC Component Checklist is innovation specific and can be used to record the ways each potential user is using the various parts of the innovation.

Support Strategies Scenarios and Activities

Handout
S - 3

1. Adding and linking resources: A Scenario.

Two teachers are writing their lesson plans. They want to preview software and determine how to link the use of that software to other instructional activities. In their building there is only one floppy disk copy of a software program that they think may be appropriate. They think that there may be some other appropriate programs, but they are not sure. They think that there may be other copies in the district software resource center, but they are not sure of that center's hours and location. They want that one potentially appropriate software program up and running on a computer as they write their plans. The computer that they use is now in the lab on another floor, and they must either bring it back or go work in the lab.

2. Helping teachers understand the possibilities: A Scenario.

Four teachers are being successful in their efforts to implement the four essentials associated with curriculum correspondence (1. write lesson plans; 2. preview, select, and modify software; 3. link the computer activity; and 4. group students). They are all using drill and practice math programs and they are currently sending one or two students to work at the computer for fifteen minute sessions. Two of these teachers are first grade teachers who share one computer and have full control over how they schedule its shared use. They have no pre-arranged schedule that involves sharing or trading students in association with ability re-grouping. These teachers have the option to let computer use influence their respective instructional schedules. The two other teachers teach fifth and sixth grade respectively. However, they each share the use of two computers with three other fifth grade teachers and three other six grade teachers respectively. In addition, these two teachers are in a situation with pre-arranged sharing or trading of students in association with ability re-grouping. If all four of these teachers wanted to move on to use simulation software in math and social studies as they worked to group students according to social and classroom factors and post/share the schedule for time grouping and software to be used they would face different demands and might need different support with respect to understanding the possibilities.

3. Providing specific staff development sessions: A continuation of the above scenario.

The above scenario suggests the possibility of arranging some special sessions or some adjustments in the included sessions. Perhaps all the teachers want to work more with simulations. Perhaps all the teachers are have major concerns about scheduling, but the nature of their concerns are different.

4. Consulting and collaborative problem solving: A continuation of the above scenario.

The concerns outlined in the above scenario might be better addressed with consultation and collaborative problem solving. The first grade teachers have a better chance of working out their problems on their own. The other teachers will more likely need the help of the support person who arranges the schedule.

Scenarios and Activities, Continued

Handout
S - 3

5. Organizing the technology: A Scenario.

All the primary grade teachers have been given a lab with math courseware installed on the hard drive. All their students are scheduled into the lab for 30 minute periods. All of the old free standing computers that could not be linked to the hard drive and the old reading and language arts software (commercial software with only one original and one back-up copy) have been collected and are in the store room. How could the old computers and the copies of the commercial software be distributed and organized?

6. Giving solutions: Make collections of solutions.

Developing systems for providing assistance can be a challenge. Participants should collect and share approaches that they have used.

7. Providing technical assistance: Make a list.

Teachers and support personnel can make a list of the technical problems encountered and technical problems solved. These lists can be shared. Unsolved problems require trouble shooting or securing the assistance of persons with more expertise.

8. Providing models and demonstrations: Collect lessons and video tapes of demonstrations.

Teachers and support personnel should share lesson plans with computer integration, demonstrate lessons with computer integration, and collect video tapes. Opportunities for observational learning should be maximized.

9. Energizing and motivating.

Teachers should be encouraged at every opportunity. Teachers should be rewarded and praised for their hard work.

10. Developing support structures.

Software sharing times can be arranged. Teachers can be encouraged and required to discuss the integration of technology during already existing meeting and common planning times. Technology integration should be a standing inservice topic.

11. Supporting teachers emotionally.

Have teachers share the ways that they have overcome some of their own frustrations. In other words, have teacher tell others how they have successfully coped with their frustrating experiences.

12. Evaluating and monitoring.

Monitoring and evaluating can be formal and informal. Informal approaches include more casual interviews and discussion over lunch. Teachers progress can be checked intermittently and feedback shared.

Workshop Evaluation

Support Module

Handout S - 4

Title of Module (Session): ______________________________

Location: ______________________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by______________________I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 **Poor**

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 **Vague**

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 **Dull**

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 **Inadequate**

5. The presentation was:

Excellent 1 2 3 4 5 **Poor**

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 **No Benefit**

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 **Poor**

SET-3

EVALUATION MODULE

Evaluation of the TIE Model

INTRODUCTION: This module is intended to provide a description of the procedures needed to conduct an evaluation of the implementation of the TIE model. The module will be composed of Instructor Notes with:

(A) Participant Handouts
(B) Transparencies
(C) A Workshop Evaluation Form

TIME REQUIRED: 75 to 90 minutes.

TARGET AUDIENCE: Building change facilitators, administrators, and special and regular education teachers of students with mild handicapping conditions.

PARTICIPANT REQUIREMENTS:

A. Interest in evaluating the integration of technology.
B. Participation in workshop activities and discussion.
C. Interest and willingness to work with teachers in learning how to integrate technology into ongoing instruction.

Evaluation of the TIE Model

TIE
Evaluation

SHOW: Transparency 1. *Participant Survey*

REFER TO: Handout 1.

Handout
E - 1

Introduction: This session will provide participants with a description of the procedures for conducting an evaluation of the implementation of an innovation, the TIE model for integrating technology into the instruction of elementary students with mild handicapping conditions. The **focus** will be an assessment of the dimensions of implementation of TIE as it occurs at the user level. The **practice** will include interviewing, observing and collaborating with teachers using technology for the instruction of students with mild handicaps. The **readiness** for evaluating the adoption of TIE is based upon the desire to use technology effectively for elementary level instruction.

TIE
Evaluation

SHOW: Transparency 2.

Objectives

- ***describe the procedures for administering and interpreting the Stages of Concern (SoC) Questionnaire.***
- ***provide techniques for administering Levels of Use (LoU) interview and procedures for recording and interpreting responses.***
- ***identify components of Innovation Configuration (IC) for observing and documenting the implementation of the innovation.***

READ: The Concerns-Based Adoption Model (CBAM) is a conceptual framework for the advancement of theory and research, and a methodology for adoption implementation, and evaluation of educational change (innovation).No framework can capture all the complexity of the process of

(Continued on next page)

change, but the CBAM framework has been used successfully with a broad array of educational innovations.

TIE Evaluation

SHOW: Transparency 3.

Basic Assumptions of CBAM

Change is a process, not an event.

Change is personal, and it is essential to understand the point of view of those participating in the change.

Change which is made by individuals first, and then by institutions, is developmental in nature.

READ: The change process in schools cannot be portrayed as a linear stepwise planning process. Planning steps and change processes can follow a sequence, but in the real world often they are cyclical, interactive, and sometimes recursive. Implementation plans might be aborted which may impact the assessment of need. The result can be attributed to too much pre-implementation preparation of inflexible plans, too much training without job-embedded practice, and too little opportunity for support during implementation.

DISCUSS: Examples of innovations implemented in participants' professional experiences. What was the outcome of the innovation? What key elements affected the outcome?

TIE Evaluation

SHOW: Transparency 4.

Diagnostic Dimensions of Innovation Implementation

- ***Stages of Concern: SoC***
- ***Levels of Use: LoU***
- ***Innovation Configurations: IC***

READ: There are three dimensions used to determine the degree of implementation of an innovation. The first is the Stages of Concern (SoC) dimension which addresses how innovation users perceive an innovation. The second is the Levels of Use (LoU) which is a focused interview used to assess the extent to which an individual uses the innovation. The third one is the Innovation Configuration (IC) which provides an analysis of how each component of the innovation is actualized. These three diagnostic dimensions are described more fully in this session.

TIE
Evaluation

SHOW: Transparency 5.

Stages of Concern

6 Refocusing
5 Collaboration
4 Consequence
3 Management
2 Personal
1 Informational
0 Awareness

READ: Stages of Concern relates to seven types of concerns that individuals experience as they proceed through the change process. These range from early concerns about "self," to concerns about "task," and finally to concerns about "impact". On Transparency 5 you can see some typical expressions of concern about the innovation. The content of the user's expressions can be interpreted to represent a point on the scale used to rate Stages of Concern. A reliable and valid instrument for measuring Stages of Concern, the SoC Questionnaire, as well as methods for interpreting the measures, are available and have been used extensively.

Handout
E - 2

REFER TO: Handout 2.

Stages of Concern Questionnaire

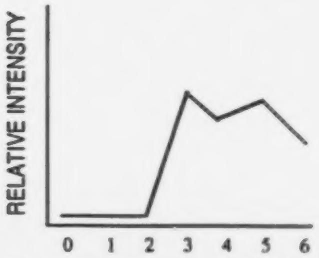
ACTIVITY: Participants will complete the Stages of Concern Questionnaire (Handout 2). Allow fifteen minutes.

DISCUSS: Items on the questionnaire that are example expressions relevant to each stage of concern.

TIE
Evaluation

SHOW: Transparency 6.

Profile of Hypothetical User



READ: The graph in Transparency 6 depicts the Stages of Concern of a hypothetical user of the innovation. As a teacher moves from being a non-user, to an inexperienced user, to an experienced user, the peaks of concern move from 0 Awareness and 1 Information, to 3 Management, to the final three stages dealing with the impact of the innovation.

ASK: Where would the peak occur for a user at the informational level; management level; collaboration level?

READ: The typical nonuser has high intensity concerns at stages 0 Awareness, 1 Informational, and 2 Personal. As the user begins to use the innovation, stage 3 Management concerns become the most intense. Then, as the user becomes experienced and skilled, Stage 0, 1, 2, and 3 concerns decrease and Stages 4 Consequence, 5 Collaboration, and 6 Refocusing become more intense.

Handout
E - 3

REFER TO: Handout 3.

Concerns and the Facilitation of Change

READ: Handout 3 provides examples of interventions that might be useful for obviating the user's concerns. It is helpful to recognize these concerns and to be able to respond appropriately to facilitate the use of the innovation.

READ: Levels of Use (LoU) describes how an individual's performance changes as he or she becomes more familiar with an innovation and more skillful at using it. The Stages of Concern dimension focuses on perceptions about the innovation; Levels of Use focuses on whether, and how, the educator is using an innovation.

TIE
Evaluation

SHOW: Transparency 7.

Handout
E - 4

REFER TO: Handout 4.

Levels of Use of the Innovation

Level 0 - Non-use
Level I - Orientation
Level II - Preparation
Level III - Mechanical Use
Level IVA - Routine
Level IVB - Refinement
Level V - Integration
Level VI - Renewal

READ: Typically an individual begins with LoU 0 "non-use" of the innovation, then moves to LoU I "orientation" about the innovation and LoU II "preparation" for use. Initial use is typically at LoU III "mechanical," but as experience increases, innovation users progress to a LoU IVA "routine" level of use and eventually may reach various "refinement" levels (LoU IVB, V, VI), where changes are made based on formal or informal assessments of student needs. The decision points between each level are determined by information related in the LoU interview. A focused interview procedure has been developed and validated to measure Levels of Use. The interviewing procedure is to follow the sequence of questions as they occur on the interview form. Typically, the interview is recorded for later analysis. Brief notes can be made, but the interview should flow as a conversation would. The emphasis is on what the users are doing, not on how they feel about it.

Handout
E - 5

REFER TO: Handout 5.

Levels of Use Interview

ACTIVITY: Divide participants into pairs. Have one person conduct the interview with his or her partner.

DISCUSS: Responses to the interviews regarding comments that could be interpreted to arrive at the decision points listed on Handout 5.

READ: The third diagnostic dimension that is important in understanding and describing the change process is Innovation Configurations (IC). The IC component checklist is a tool for identifying and measuring specific components of an innovation and the variations that might be expected. This concept is used to describe the various operational forms of an innovation that result as individual users adapt it for use in their particular situations.

TIE
Evaluation

SHOW: Transparency 8.

Key Questions for IC Checklists

What are the crucial, or essential components?

What will users and students be doing when the innovation is in place?

What will be measured by observation and what will be measured by a formal interview?

READ: The IC Component Checklist is innovation specific and can be used to record and reflect the was each user is implementing the various parts of the innovation. Key questions should be asked in developing the IC checklists. Quite simply, successful implementation requires arriving at a common understanding of the innovation in operation. This involves the evaluators and users coming to a consensus on the essential components of the innovation. There must be agreement on the observable indicators and operational definitions that comprise the innovation. The IC's for the Technology Integration Model were formulated for each element: Curriculum Correspondence, Instructional Organization, and Monitoring Progress.

TIE
Evaluation

SHOW: Transparencies 9, 10, and 11.

IC Checklists

REFER TO: Handouts 6, 7, and 8.

Handout
E - 6,7 & 8

READ: Thus progress on an innovation can be measured in terms of data provided by these three dimensions (ie. SoC, LoU, IC) and their associated instruments for individuals and groups. These measures of implementation progress provide formative evaluation feedback which informs the process of formulating and providing innovation interventions.

SUMMARY

READ: The change process for any innovation takes time and is accomplished through appropriate concerns-based training in the innovation. The Technology Integration Enhancement model was implemented from August, 1989 through May, 1991. During the first year, implementation began in eleven schools across four Local Education Agencies. The training for teachers was organized according to the three elements of instruction which formed the basis for the Innovation Configuration checklists. The first measure, Stages of Concern, addressed how the individuals perceived the innovation and their concerns about the effects of implementing it. The Levels of Use captured how individuals changed as they became more familiar with the innovation and more skillful at using it. The third diagnostic dimension, Innovation Configuration, ordered the range ofteacher behavior by the degree of use of the innovation. The results of the evaluation of TIE over the two school years suggest that teacher attitudes and use of technology change across time with the provision of well-designed staff development. The results of the research also indicate that these changes are maintained over time through consultation and collaboration.

Handout
E - 9

EVALUATION

End of Session.
Participants complete evaluation.

Introduction

TIE
Module-E
T-1

Please Complete

Handout 1

Participant Survey

(If you have not already done so)

Thank you!

Participant Survey

TIE
Module-E

Handout
E - 1

Name:____________________ District:____________________

Address:____________________ Telephone:____________________

School or Office:____________________ Grade Level:____________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:____________________

____

____

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1 **2** **3** **4** **5**

(beginner) (competent/comfortable) (expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

   100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer? **YES** **NO**
3. Can you obtain further access by using a computer lab? **YES** **NO**
4. Do you know how to use many published software products? **YES** **NO**
5. Have you used a wide range of published software in your classroom? **YES** **NO**
6. Have you integrated many published software products into your:
   - weekly instructional plan? **YES** **NO**
   - daily lesson plan? **YES** **NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products? **YES** **NO**

Objectives

OBJECTIVES

- **Describe the procedures for administering and interpreting the Stages of Concern (SoC) Questionnaire.**

- **Provide techniques for administering the Levels of Use (LoU) interview and procedures for recording and interpreting responses.**

- **Identify the components of the Innovation Configuration (IC) for observing and documenting the implementation of the innovation.**

Basic Assumptions of CBAM

- Change is a process, not an event.
- Change is personal, and it is essential to understand the point of view of those participating in the change.
- Change which is made by individuals first, and then by institutions is developmental in nature.

Diagnostic Dimensions of Innovation Implementation

Stages of Concern: SoC

Levels of Use: LoU

Innovation Configuration: IC

Stages of Concern

TIE
Module-E
T-5

Stages of Concern

6 Refocusing

5 Collaboration

4 Consequence

3 Management

2 Personal

1 Informational

0 Awareness

Stages of Concern Questionaire

TIE
Module-E

Handout
E-2

Introduction: The purpose of this questionnaire is to determine what people who are using or thinking about using technology integration enhancement (TIE) are concerned about at various times during the innovation adoption process. The items were developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years experience using them. Therefore, some of the questions may appear to have little or no relevance to you at this time. For the completely irrelevant items, please circle "0" on the scale. Other items will represent those concerns you do have, in various degrees of intensity, and should be marked higher on the scale.

For example: This statement is true of me at this time. 0 1 2 3 4 5 6 [✓ 7]
This statement is somewhat true of me now. 0 1 2 3 [✓ 4] 5 6 7
This statement is not at all true of me at this time. 0 [✓ 1] 2 3 4 5 6 7
This statement seems irrelevant to me. [✓ 0] 1 2 3 4 5 6 7

Please respond to the items in terms of your present concerns, or how you feel about your involvement, or potential involvement with TIE. We do not hold to any one definition of this innovation, so please think of it in terms of your own perception of what it involves. Since this questionnaire is used for a variety of innovations, the name TIE never appears. However, phrases such as "the innovation", "this approach", or "the new system" all refer to TIE. Remember to respond to each item in terms of your present concerns about your involvement or potential with TIE. Thank you for taking the time to complete this task. **Read key and begin questionnaire:**

SoC Questionnaire Items

0	**1 2**	**3 4 5**	**6 7**
Irrelevant	**Not true of me now**	**Somewhat true of me now**	**Very true of me now**

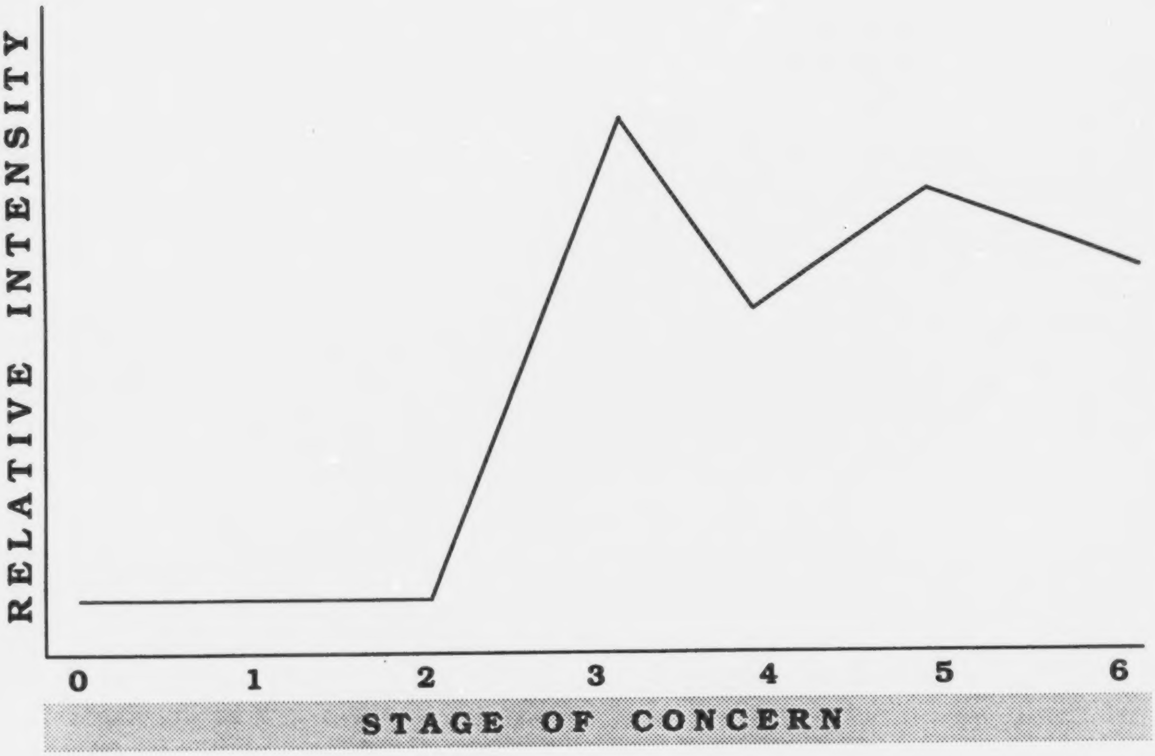
1. I am concerned about students' attitudes toward this innovation. 0 1 2 3 4 5 6 7
2. I now know of some other approaches that might work better. 0 1 2 3 4 5 6 7
3. I don't even know what the innovation is. 0 1 2 3 4 5 6 7
4. I am concerned about not having enough time to organize myself each day. 0 1 2 3 4 5 6 7
5. I would like to help other faculty in their use of the innovation. 0 1 2 3 4 5 6 7
6. I have a very limited knowledge about the innovation. 0 1 2 3 4 5 6 7
7. I would like to know the effect of reorganization on my professional status. 0 1 2 3 4 5 6 7
8. I am concerned about conflict between my interests and my responsibilities. 0 1 2 3 4 5 6 7
9. I am concerned about revising my use of the innovation. 0 1 2 3 4 5 6 7
10. I would like to develop working relationships with both our faculty and outside faculty using this innovation. 0 1 2 3 4 5 6 7
11. I am concerned about this innovation. 0 1 2 3 4 5 6 7

SoC Questionnaire Items, continued

0	1 2	3 4 5	6 7
Irrelevant	**Not true of me now**	**Somewhat true of me now**	**Very true of me now**

13. I would like to know who will make the decisions in the new systems.	0	1	2	3	4	5	6	7
14. I would like to discuss the possibility of using the innovation.	0	1	2	3	4	5	6	7
15. I would like to know what resources are available if we decide to adopt this innovation.	0	1	2	3	4	5	6	7
16. I am concerned about my inability to manage all that the innovation requires.	0	1	2	3	4	5	6	7
17. I would like to know how my teaching or administration is supposed to change.	0	1	2	3	4	5	6	7
18. I would like to familiarize other departments or persons with the progress of this new approach.	0	1	2	3	4	5	6	7
19. I am concerned about evaluating my impact on students.	0	1	2	3	4	5	6	7
20. I would like to revise the innovation's instructional approach.	0	1	2	3	4	5	6	7
21. I am completely occupied with other things.	0	1	2	3	4	5	6	7
22. I would like to modify our use of the innovation based on the experiences of our students.	0	1	2	3	4	5	6	7
23. Although I don't know about this innovation, I am concerned about things in this area.	0	1	2	3	4	5	6	7
24. I would like to excite my students about their part in this approach.	0	1	2	3	4	5	6	7
25. I am concerned about time spent working with nonacademic problems related to this innovation.	0	1	2	3	4	5	6	7
26. I would like to know what the use of the innovation will require in the immediate future.	0	1	2	3	4	5	6	7
27 I would like to coordinate my effort with others to maximize the innovation's effects.	0	1	2	3	4	5	6	7
28. I would like to have more information on time and energy commitments required by this innovation.	0	1	2	3	4	5	6	7
29. I would like to know what other faculty are doing in this area.	0	1	2	3	4	5	6	7
30. At this time, I am not interested in learning about this innovation.	0	1	2	3	4	5	6	7
31. I would like to determine how to supplement, enhance, or replace the innovation.	0	1	2	3	4	5	6	7
32. I would like to use feedback from students to change the program.	0	1	2	3	4	5	6	7
33. I would like to know how my role will change when I am using the innovation.	0	1	2	3	4	5	6	7
34. Coordination of tasks and people is taking too much of my time.	0	1	2	3	4	5	6	7
35. I would like to know how this innovation is better than what we have now.	0	1	2	3	4	5	6	7

Profile of Hypothetical User



Profile of Hypothetical User

Handout
E-3

Concerns and the Facilitation of Change

A first step in using concerns to guide interventions is to know what concerns the individuals have, especially their most intense concerns. The second step is to deliver interventions that might respond to those concerns. Unfortunately, there is no absolute set of universal prescriptions, but the following suggestions offer examples of interventions that might be useful.

Stage 0 — Awareness Concerns

a. If possible, involve teachers in discussions and decisions about the innovation and its implementation.
b. Share enough information to arouse interest, but not so much that it overwhelms.
c. Acknowledge that a lack of awareness is expected and reasonable, and that no questions about the innovation are foolish.
d. Encourage unaware persons to talk with colleagues who know about the innovation.
e. Take steps to minimize gossip and inaccurate sharing of information about the innovation.

Stage 1 — Informational Concerns

a. Provide clear and accurate information about the innovation.
b. Use a variety of ways to share information—verbally, in writing, and through any available media. Communicate with individuals and with small and large groups.
c. Have persons who have used the innovation in other settings visit with your teachers. Visits to user schools could also be arranged.
d. Help teachers see how the innovation relates to their current practices, both in regard to similarities and differences.
e. Be enthusiastic and enhance the visibility of others who are excited.

Stage 2 — Personal Concerns

a. Legitimize the existence and expression of personal concerns. Knowing these concerns are common and that others have them can be comforting.
b. Use personal notes and conversations to provide encouragement and reinforce personal adequacy.
c. Connect these teachers with others whose personal concerns have diminished and who will be supportive.
d. Show how the innovation can be implemented sequentially rather than in one big leap. It is important to establish expectations that are attainable.
e. Do not push innovation use, but encourage and support it while maintaining expectations.

Concerns and the Facilitation of Change, cont.

Stage 3 — Management Concerns

a. Clarify steps and components of the innovation. Information from innovation configurations will be helpful here.
b. Provide answers that address the small specific "how-to" issues that are so often the cause of management concerns.
c. Demonstrate exact and practical solutions to the logistical problems that contribute to these concerns.
d. Help teachers sequence specific activities and set timelines for their accomplishments.
e. Attend to the immediate demands of the innovation, not what will be or could be in the future.

Stage 4 — Consequence Concerns

a. Provide these individuals with opportunities to visit other settings where innovation is in use and to attend conferences on the topic.
b. Don't overlook these individuals. Give them positive feedback and needed support.
c. Find opportunities for these persons to share their skills with others.
d. Share with these persons information pertaining to the innovation.

Stage 5 — Collaboration Concerns

a. Provide these individuals with opportunities to develop those skills necessary for working collaboratively.
b. Bring together those persons, both within and outside the school, who are interested in collaboration.
c. Help the collaborators establish reasonable expectations and guidelines for the collaborative effort.
d. Use these persons to provide technical assistance to others who need assistance.
e. Encourage the collaborators, but don't attempt to force collaboration on those who are not interested.

Stage 6 — Refocusing Concerns

a. Respect and encourage the interest these persons have for finding a better way.
b. Help these individuals channel their ideas and energies in ways that will be productive rather than counterproductive.
c. Encourage these individuals to act on their concerns for program improvement.
d. Help these persons access the resources they may need to refine their ideas and put them into practice.
e. Be aware of and willing to accept the fact the these persons may replace or significantly modify the existing innovations.

Individuals do have concerns about change, and these concerns will have a powerful influence on the implementation of change. The CBAM offers several easy ways to identify these concerns. It is up to those who guide change to identify concerns, interpret them, and then act on them.

(from Hord & Hall, 1984; p 100)

Levels of Use of the Innovation

TIE
Module-E
T-7

Levels of Use of the Innovation

Level 0 - Non-use

Level I - Orientation

Level II - Preparation

Level III - Mechanical Use

Level IVA - Routine

Level IVB - Refinement

Level V - Integration

Level VI - Renewal

Levels of Use of the Innovation

TIE
Module-E

Handout
E-4

Level 0—Non-use
State in which the individual has little or no knowledge of the innovation, no involvement with it, and is doing nothing toward becoming involved.

Decision Point A—*Takes action to learn more detailed information about the innovation.*

Level I—Orientation
State in which the individual has acquired or is acquiring information about the innovation and/or has explored its value orientation and what it will require.

Decision Point B—*Makes a decision to use the innovation by establishing a time to begin.*

Level II—Preparation
State in which the user is preparing for first use of the innovation.

Decision Point C—*Begins first use of the innovation.*

Level III—Mechanical Use
State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than needs of students and others. The user is primarily engaged in an attempt to master tasks required to use the innovation. These attempts often result in disjointed and superficial use.

Decision Point D-1—*A routine pattern of use is established.*

Level IVA —Routine
Use of the innovation is stabilized. Few, if any, changes are being made in ongoing use. Little preparation or thought is being given to improve innovation use or its consequences.

Decision Point D-2—*Changes in use of the innovation based on formal or informal evaluation in order to increase client outcomes.*

Level IVB—Refinement
State in which the user varies the use of the innovation to increase the impact on students within their immediate sphere of influence. Variations in use are based on knowledge of both short and long-term consequences for students.

Decision Point E —*Initiates changes in use of the innovation based on input from and in coordination with colleagues for benefit of clients.*

Level V—Integration
State in which the user is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.

Decision Point F—*Begins exploring alternatives to or major modifications of the innovation presently in use.*

Level VI—Renewal
State in which the user reevaluates the quality of use of the innovation, seeks major modifications of, or alternatives to, present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the organization.

Levels of Use Interview

Handout
E-5

Levels of Use Interview

1. Are you integrating the use of computers for instruction in your classroom? (If answer is no, proceed to sheet A; if answer is yes, continue)

2. Please tell me how you integrate the use of computers.

3. Do you mention computers in your written lesson plans?

4. Do you mention any specific software programs by name? How do you make decisions about which software to use?

5. Do you group students for working at the computer? (If yes, say "Please explain how you make the decisions").

6. What kinds of assistance do you give the students:
    a) before CAI
    b) during CAI
    c) after CAI?

7. What do you see as the strengths of the way you integrate the use of computers?

8. Do you see any weaknesses in the way you integrate them? Please explain. Have you made any attempt to do anything about the weaknesses? (Probe those they mention specifically).

9. Are you currently looking for further information about integrating computers into your classroom instruction?
    a) What kind of information?
    b) For what purposes?

10. Do you ever talk with others about integrating computers into instruction? (If yes, ask "What do you tell them?")

11. Have you considered any alternatives or different ways of integrating computers into your classroom instruction?

12. Are you doing any evaluating of the integration of computers into your classroom? Please explain any formal methods you use. What about informal methods?

13. Have you received any feedback from students that would affect the integration of computers in your instruction? (If yes, ask "What did you do with the information you received?")

Levels of Use Interview, cont.

**Handout
E-5**

14. Have you made any changes recently in how you integrate computers into your instruction?
    If answer is yes, ask
    - a) What were the changes?
    - b) Why did you make them?
    - c) How recently were the changes made?

    (If answer is no, ask 14 d) Are you considering making any changes?
    (If yes, ask why and what are the proposed changes?)

15a). Do you work with others in integrating computers into your instruction?
(If answer is no, ask questions 22 and 23, if answer is yes, continue)

15b). Do you meet on a regular basis?

15c). Have you made any changes in your integration of computers into your instruction based on this coordination?

16. Please describe for me how you work together. (What things do you share with each other?)

17. What do you see as the effects of this coordination?

18. Are you looking for any particular kind of information in relation to this working together?

19. Do you talk with others about working together? If so, what do you share with them?

20. Have you done any formal or informal evaluation of how your talking with others is working?

21. What plans do you have for this effort in the future?

22. As you look ahead what plans do you have in relation to the integration of computers into your classroom instruction?

23. Do you have any concerns about integrating computers into your classroom integration?

Levels of Use Interview (Sheet A)

Handout
E-5

Levels of Use Interview (Sheet A)

1. Have you ever tried integration of computers into your instruction in the past?
   If the answer is no, skip to question 2.
   If the answer is yes, continue:
   - a) When did you try integration?
   - b) Why did you stop?
   - c) How did you organize the integration?
   - d) Did you find any problems, and if so what were they?
   - e) What were the effects on the student?
   - f) When you assess integration what do you see as the strengths?
   - g) Do you see any weaknesses?

2. Have you made a decision to integrate computers into your classroom instruction in the future? If yes, when?

3. Can you describe the integration of computers into classroom instruction as you see it?

4. Are you currently looking for any information about integrating computers into your instruction?
   If the answer is yes, ask :
   - a) What kinds of information?
   - b) For what purpose?

5. What do you see as the strengths of computer integration in your situation?

6. Do you see any weaknesses? If so, what are they?

7. At this point in time, what kinds of questions are you asking about integration of computers into classroom instruction? (Give examples as necessary, such as: Now that the students are comfortable with the computers, do I really have to stay involved? Can't they just work on their own now?)

8. Do you ever talk with others and share information about integrating computers into classroom instruction? What do you share?

9. Can you tell me about any preparation or plans you have been making for integrating computers into your classroom instruction?

10. Can you summarize for me where you see yourself right now in relation to the integration of computers into your instruction?

Key Questions for IC Checklists

- What are the crucial, or essential components?

- What will users and students be doing when the innovation is in place?

- What will be measured by observation and what will be measured by a formal interview?

Innovation Configuration Components Classroom Level TIE Strategies

TIE
Evaluation
T-9

Teacher____________________ **Date**____________________ **Rater**____________________

CURRICULUM CORRESPONDENCE CONFIGURATION CHECKLIST

Handout
E-6

Component 1: Advance Planning

1. Writes lesson plans naming content specific software which matches IEP.
2. Writes lesson plans indicating use of content specific software.
3. Writes lesson plans which indicate use of CAI but does not name specific software.
4. Uses computer as tool but does not include in written lesson plans.
5. Does not plan use of computer as instructional tool.

Component 2: Short-term Planning (Software Selection)

1. Previews, selects and/or modifies software with correspondence to meet student curriculum and skill objectives as written in IEP.
2. Previews and selects software described as being in the relevant grade range content.
3. Selects software with no correspondence to curriculum.
4. Does not preview software.

Component 3: Use of Appropriate Software to Enhance Student Learning

1. Uses software which matches student's curriculum and skill level objectives as written in IEP.
2. Uses software selected for relevant grade level or content correspondence.
3. Uses any available software without regard to correspondence.
4. Does not use software as an instructional tool.

Component 4: Evaluation of Curriculum Correspondent Software for Future Planning

1. Records students' progress with curriculum congruent software at each session and uses data for future planning.
2. Records student progress on CAI regularly, but not at each use, and uses for future planning.
3. Evaluates use of CAI, but does not use data for future planning.
4. Does not evaluate the use of CAI.

To left of slashed line: Full implementation of the component

Between slashed and solid lines: Partial implementation of the component

To right of solid line: Lack of implementation of the component

Innovation Configuration Components Classroom Level TIE Strategies

Teacher____________________ Date__________________ Rater____________________

TIE Evaluation T-10

Handout E-7

INSTRUCTIONAL ORGANIZATION CONFIGURATION CHECKLIST

Component 1: Planning			
1. Writes plans to group students with similar instructional objectives in appropriate numbers (1,2, or 3) at the computer for learning activities, and posts long-term (weekly) computer schedule.	2. Plans to give teacher assistance in the form of verbal, visual or tactile directions.	3. Plans to group atudents at the computer according to similarity of needs and instructional objectives.	4. Does not plan to group students nor to offer any assistance during CAI.
Component 2: Advance Organizers			
1. Gives appropriate verbal directions, has available visible instructions to students, and discusses grouping arrangements prior to CAI activities.	2. Gives some verbal directions or other assistance to students prior to their participation in a CAI activity.	3. Groups students at the computer before CAI according to their instructional needs and objectives.	4. Does not group students nor give any assistance prior to CAI.
Component 3: Use			
1. Groups students at computers in appropriate groups (1, 2 or 3 students), and gives verbal, visual or tactile help to students whenever necessary during computer activities.	2. Students are not grouped for CAI according to needs, but teacher gives assistance when needed.	3. Students work in groups of 1, 2 or 3 students according to similarity of needs and instructional objectives.	4. Does not group students nor give assistance during CAI.
Component 4: Evaluation			
1. Consistently evaluates students' progress during and at the end of each computer session.	2. Checks on students' progress on CAI at the end of each use.	3. Checks on students' progress on CAI periodically.	4. Does not monitor students' progress during or after CAI activities.

To left of slashed line: Full implementation of the component

Between slashed and solid lines: Partial implementation of the component

To right of solid line: Lack of implementation of the component

Innovation Configuration Components Classroom Level TIE Strategies

Teacher________________________ **Date**____________________ **Rater**________________________

TIE
Evaluation
T-11

MONITORING PROGRESS CONFIGURATION CHECKLIST

Handout
E-8

Component 1: Planning

1. Plans for using software include both teacher and students collecting performance information.	2. Plans for student use of software with performance recording features.	3. Plans to use software with performance recording features for own benefit.	4. Does not plan to use software programs with performance recording features.

Component 3: Use

1. Uses performance record keeping features of CAI for measuring student progress, and students use performance features for self-monitoring.	2. Teacher uses performance record keeping features for measuring student progress.	3. Students use record keeping features for self-monitoring.	4. Computer is not used for monitoring progress.

Component 4: Evaluation

1. Uses performance features of CAI for measuring student progress, and students chart or collect performance records from CAI.	2. Requires CAI assignments and records performance as part of summative evaluation for grading.	3. Uses performance recording features of CAI for evaluating student progress and help in future planning.	4. Does not use computer to evaluate student progress, and students do not use computers to monitor their own progress.

To left of slashed line: Full implementation of the component

Between slashed and solid lines: Partial implementation of the component

To right of solid line: Lack of implementation of the component

Informal Evaluation

Determine procedures
for informal evaluation of the
implementation of
the innovation

Workshop Evaluation

TIE
Module-E

Handout
E-9

Title of Module (Session): ____________________

Location: ____________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by____________________I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 **Poor**

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 **Vague**

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 **Dull**

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 **Inadequate**

5. The presentation was:

Excellent 1 2 3 4 5 **Poor**

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 **No Benefit**

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 **Poor**

TEACHERS' TECHNOLOGY
RESOURCE GUIDE

TEACHERS' TECHNOLOGY
RESOURCE GUIDE

A Directory of Resources to support the implementation of the **TIE MODEL**: the Technology Integration Enhancement Model. This guide was prepared by the staff of the Technology Integration Project with contributions from LINC Resource, 1989.

TEACHERS' TECHNOLOGY RESOURCE GUIDE

First Edition (October 1989)
(Revised 1991)

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TEACHERS' TECHNOLOGY RESOURCE GUIDE

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1. MAGAZINES AND NEWSLETTERS

Why do I need to read journals, magazines and newsletters about technology?

To keep abreast of the latest developments, and new products.
To find out how my peers are using technology.
To learn about current events, workshops and conferences.

Catalyst
Western Center for Microcomputers in Special Education
1259 El Camino Real, Suite 275
Menlo Park, CA 94025
(415) 326-6997

This newsletter communicates to special education users the latest microcomputer research, development, products and applications.

Closing the Gap
P.O. Box 68
Henderson, MN 56044
(612) 248-3294

This newspaper is dedicated to exploring the uses of computers in the rehabilitation and special education fields. It covers such topics as computers, peripherals, and software. Closing the Gap provides a yearly resource guide with categorized software evaluation.

Education Computer News
Business Publishers, Inc.
951 Pershing Drive
Silver Spring, MD 20910
(301) 587-6300

Concise reports for educators and administrators who need fast, dependable, independent news on education technology, from microcomputers to video discs to fiber optics. Covers trends; new products; legislation; research; national, state, and local news; and effective use of computers.

Electronic Learning
Scholastic Inc.
730 Broadway
New York, NY 10003-9538
(212) 503-3000

Electric Learning presents nontechnical introductions for elementary and high school teachers to the educational applications of microcomputers and other learning aids. The software review section provides critiques of commercial programs by both a classroom teacher and content area specialist or school administrator.

LINC Notes Newsletter
LINC Resources, Inc.
4820 Indianola Ave.
Columbus, OH 43214
(614) 885-5599

This newletter provides demographic information on technology resource centers and publishing opportunities.

MECC Network
6160 Summit Drive, North
Minneapolis, MN 55430
(612) 569-1500

Instructional newsletter describing activities of the Minnesota Educational Computing Corporation and listing materials available from MECC.

Media and Methods
1429 Walnut Street, 4th floor
Philadelphia, PA 19102
(215) 563-3501

Includes articles and departments on the state-of-the-art educational technologies including computer assisted and audiovisual education.

PC Computing
1 Park Ave.
New York, NY 10016
(212) 503-5105

This is a general interest magazine for IBM and IBM compatible computers.

PC Magazine
P.O. Box 2886
Boulder, CO 80322
(303) 447-9330

This is a non-technical magazine and guide to IBM personal computers and compatibles.

PC Week
10 President Landing
Medford, MA 02155
(617) 393-3700
This is a weekly newspaper of corporate microcomputing, devoted to IBM computers and compatibles.

Sunburst Solutions
Sunburst Communications
39 Washington Avenue
Pleasant, NY 10570
(800) 628-8897

Newsletter with up to date information on computers in education, new products and innovative teaching ideas.

TAM Newsletter
Technology and Media Division
The Council for Exceptional Children
1920 Association Drive
Reston, VA 22091
(703) 620-3666

Provides news and information to TAM members.

The Videodisk Monitor
Future Systems, Inc.
PO Box 26
Falls Church, VA 22040
(800) 323-3472 or (703) 241-1799

This newsletter offers a complete guide to the converging worlds of videodisc, compact disc and computer technologies. It contains comprehensive articles on new products, technological developments, marketing strategies and new applications.

2. ASSOCIATIONS AND JOURNALS

Why would I join professional associations?

They provide subscriptions to journals and magazines.
These journals publish articles and devote whole issues to microcomputer applications in a particular discipline.
They also provide advice on appropriate software packages, and many of them offer reviews of available software.
They provide professional development opportunities.

American Educational Research Association (AERA)
1230 Seventeenth St. N.W.
Washington, DC 20036
(202) 223-9485

AERA consists of university researchers and has a subgroup that is expressly interested in computer-assisted instruction. Publishes American Educational Research Association Journal.

Association for Educational Communications and Technology (AECT)
2025 Vermont Ave.
Suite 820
Washington, DC 20005
(202) 347-7834

AECT is an organization of media specialists who are particularly interested in the use of media and technology for learning. Publishes Instructional Innovator, Journal of Instructional Development, and Educational Communication and Technology Journal.

CEC
Council for Exceptional Children
1920 Association Drive
Reston, VA 22091
(703) 620-3660
(800) 873-8255

The focus of this organization is special education. Publishes "Exceptional Children and "Teaching Exceptional Children." It also includes a Technology and Media Division (TAM), which publishes "The Journal of Special Education Technology."

International Reading Association
800 Barksdale Road
Newark, DE 19714

This organization sponsors a subcommittee interested in the use of computers in reading education. Publishes titles on computer applications in reading.

International Society for Augmentative and Alternative Communication
Decker Periodicals, Inc.
P.O. Box 620
Station A
Hamilton, Ontario L8N3K7
(416) 522-7071

This is an organization which serves speech-language specialists and special educators with an interest in communication disorders as well as rehabilitation engineers. Publishes *Augmentative and Alternative Communication.*

Journal of Educational Computing Research
Baywood Publishing Company, Inc.
26 Austin Ave.
Amittyville, NY 11701
(516) 691-1270

This journal publishes original refereed articles on important empirical research, development studies and critical reviews.

LDA
Learning Disabilities Associaltion
4156 Library Road
Pittsburgh, PA 15234
(412) 341-1515

LDA is composed of educators and families concerned with persons with learning disabilities.

National Council of Teachers of Mathematics (NCTM)
1906 Association Drive
Reston, VA 22091
(703) 620-9840

NCTM consists of mathematics teachers on all levels. The organization is committed to the use of computers in mathematics education. *Mathematics Teacher*, one of its publications, routinely publishes software reviews.

National Easter Seal Society
70 East Lake Street
Chicago, IL 60601
(312) 726-6200

This organization promotes computer technology and information for individuals experiencing handicaps. Publishes *Computer Disability News* which is a quarterly publication and resource for people with disabilities.

National Science Teachers Association (NSTA)
1742 Connecticut Ave., N.W.
Washington, DC 20009
(202) 328-5800

NSTA is composed of science educators at all levels, interested in using microcomputers in education. Publishes *Science and Children* and *The Science Teacher*.

RESNA
Rehabilitation Engineering Society of North America
Suite 700
1101 Connecticut Avenue
Washington, DC 20036
(202) 857-1199

This is an interdisciplinary association devoted to the advancement of rehabilitation and assistive technologies. It publishes "RESNA News"

3. MAGAZINES FOR FAMILIES

Why would I subscribe to family-centered computer publications?

To provide magazines for your school office or library available for parents or other school visitors. These periodicals can be a good resource to direct the frequent computer-oriented questions you might receive.

In addition, many general interest computer magazines have regular or frequent articles on the educational use of computers in the home setting.

Home Computer Magazine
1500 Valley River Drive, Suite 250
Eugene, OR 97401
(503) 484-1142

This magazine regularly features articles on LOGO, product reviews and game ware for IBM microcomputers.

4. SOFTWARE REVIEW CATALOGS

Why would I need to read software reviews?

They provide an in depth narrative on each piece of software and how it can best be utilized in the classroom.

Directories provide names, addresses and descriptive information about software products.

They can save you time from doing numerous software previews.

They can help you save money, and keep you from buying useless software, and help you with software evaluation.

An Update on Software in Cognitive Rehabilitation
Cognitive Rehabilitation
6555 Carrollton Avenue
Indianapolis, Indiana 46220
(317) 257-9672

Directory of special education software.

EPIE Institute
P.0. Box 839
Water Mill, N.Y. 11976
(800) 555-0000

The Educational Products Information Exchange (EPIE) Institute has established TESS which presents evaluations of commercial educational software.

Software Reviews on File
Facts on File, Inc.
460 Park Avenue, South
New York, NY 10016
(212) 683-2244

Edited by Ann Lathrop, this monthly publication focus on educational and business software as well as programs for other applications. An updated index accompanies each issue permitting quick access to excerpted review of a software package.

Whole Earth Software Catalog
27 Gate Five Road
Sausalito, CA 94965
(415)331-6249

This magazine, available through subscription and on news stands, provides reviews of software for writing, analyzing, accounting, managing, telecommunications, drawing, learning, playing, programming, and other categories. Published quarterly $18/yr.

5. SOFTWARE CURRICULUM GUIDES

Why do I need to use software/curriculum guides?

Curriculum software will help teachers match curriculum objectives with appropriate software.
There is a lot of educational software on the market, and software evaluation takes considerable time and effort.
These guides will help provide basic lesson plans.

APPLE COMPUTER EDUCATION SOLUTION GUIDES

Apple Computer, Inc., is now offering Education Solutions Guides in addition to its Curriculum Software Guides. The Education Solutions Guides are similar to the Curriculum Software Guides in that both feature software recommended by a variety of educators and software review organizations. The difference is that the Curriculum Software Guides focus on basic skills such as math and science, while the Education Solutions Guides focus on specialized subject areas such as English as a Second Language, and business education. Another distinguishing feature of the Education Solutions Guides is a section on classroom activities and software into their curriculum. The Education Solutions Guides also compare software packages against features and characteristics identified as important to educators, such as instructional quality and ease of learning and use. Each Education Solutions Guide costs $17. For more information, contact Apple Computer, Inc., Curriculum Software/Solutions Guides, P.O. Box 1834, Escondido, CA 92025, (619) 558-7150.

GROILER CURRICULUM GUIDE

Several ompanies have recently begun to respond to the cry from teachers that software must be integrated into the curriculum. The typical response has been to produce a chart that correlates the company's software titles with curriculum areas, specific skills and content objectives, educational level, and sometimes appropriateness for special education students. This is certainly a step in the right derection, but those who are seeking a more in-depth resource will be pleased with the recent 192-page curriculum guide produced by Grolier Electronic Publishing. Titled Using Grolier Software Across the Curriculum, this excellent guide contains100 detailed lesson plans for using the company's software in math, language arts, science, social studes, library science, and special education. Additional resources, including magazines and books, are also included. The guide costs $12.95. To order the guide or to obtain more information, contact Grolier at Sherman Turnpike, Danbury, CT 06816, (800) 955-8977.

BEST COPY AVAILABLE

SELECTING SOFTWARE AND VIDEO

Saving schools from a time-consuming and expensive evaluation process, the California State Department of Education has published "Technology in the Curriculum," a series of resonurce guides that judge and recommend educational software and videos for grades K-12.

Classified according to subject, the guides contain assessments and descriptions of programs with objectives that mesh with state curriculum requirements. The guides also detail the evaluation methods used by contributing educators and offer techniques for instructional uses of video and software.

Updated annually, the guides cover science, language arts, mathematics, foreign language, history, and visual and performing arts. The cost is $15 for the entire set. To order, contact Publication Sales, CA State Department of Education, P.O. Box 271, Sacramento, CA 95802-0271, (916) 445-1260.

COMPUTER USE GUIDE FOR SCIENCE TEACHERS

"A Guide To Computer Use by the Science Teacher" is a Curriculum Development Product of the Project to Increase Mastery of Mathematics and Science (PIMMS) and the Connecticut State Department of Education. The purpose of the booklet is to share with other teachers science the experiences of the writers in the use of microcomputers, so that all may learn from their past successes and failures. It is available for $3 in printed form or on disk for $2 from the Project to Increase Mastery of Mathematics and Science, Butterfield 110, Wesleyan University, Middletown, CT 06457, (203) 347-9411.

CURRICULUM INTEGRATION TOOLS OFFERED BY SOFTWARE PUBLISHERS

Increasingly, educational software publishers are offering curriculum integration tools that can assist educators in their efforts to integrate computer technology into their classrooms. Such materials range from simple listings of the curriculum objectives addressed by the publisher's software to comprehensive guidebooks that provide a variety of strategies, activities, and lesson plans for using the publisher's software across the curriculum and to complement a variety of non-computer-based instructional activities. The following is a summary of the information on technology integration tools being offered by a number of leading publishers. This information was collected through a recent survey conducted by LINC Resources, Inc.

AQUARIS INSTRUCTIONAL
P.O. Box 128
Indian Rocks Beach, FL 34635-0128
(813) 595-7890

Offers a detailed teacher's guide describing how each of its software products can be used to complement non-computer-based instruction.

COMMUNICATION SKILL BIULDERS
3830 East Belleview
P.O. Box 42050
Tucson, AZ 85733
(602) 323-7500

Offers a brief teacher's guide containing helpful hints for using its software to prepare for or follow-up typical classroom instructional activities.

THE CONTINENTAL PRESS
520 East Bainbridge St.
Elizabethtown, PA 17022-9989
(800) 233-0759 [(800) 847-0656 in PA]

Offers a brief teacher's guide containing helpful hints for using its software to prepare for or follow-up typical classroom instructional activities. (Available only with purchase of software.)

D.C. HEALTH AND CO.
123 Spring Street
Lexington, MA 02173
(617) 860-1847

For some software products, a teacher's guide is offered that correlates the curriculum/skills areas covered by the software package with generic curriculum objectives. Software is also correlated with the non-software instructional media published by the firm.

EDUCATIONAL ACTIVITIES
1937 Grand Ave.
Baldwin, NY 11510
(516) 223-4666

Offers a brief teacher's guide containing helpful hints for using its software to prepare for or follow-up typical classroom instructional activities. (Available only with purchase of software.) Also offers customized training workshops on integrating their software into the curriculum.

HOUGHTON MIFFLIN CO.
One Memorial Drive
Cambridge, MA 02142
(800) 733-7075

Software programs are accompanied by a detailed teacher's guide describing how each of the software products can be used to complement non-computer-based instructon. (Available only with purchase of software.) Some guides include correlations to popular basal textbooks.

JOSTIN LEARNING CORPORATION
6170 Cornerstone Court East
Suite 300
San Diego, CA 92121-3710
(619) 587-0087

Offers a comprehansive teacher's guidebook, entitled "the Curriculum Guide," that provides numerous strategies, activities, and lesson plans for using its software across the curriculum and to complement a variety of non-computer-based instructional activities. Also provides in-service training to teachers.

THE LEARNING COMPANY
6493 Kaiser Drive
Fremont, CA 94555
(800) 852-2255

Offers a detailed teacher's guide that lists the curriculum objectives covered by the company's software and suggests ways in which each of the software products can be used to complement non-computer-based instruction. (Available with purchase of software.)

LEANRING LAB SOFTWARE
21000 Nordhoff
Chatsworth, CA 91311
(818) 341-9611 [in California,(800) 222-7026]

Offers a comprehensive teacher's guidebook that provides varied strategies, activities, and lesson plans for using its software across the curriculum and to complement a variety of non-computer-based instructional activities.

LEGO DACTA EDUCATIONAL PRODUCTS
555 Taylor Road
Enfield, CT 06082
(800) 527-8339

Offers a detailed teacher's guide that lists the curriculum objectives covered by Lego software and suggests ways in which each of the software products can be used to complement non-computer-based instruction. (Available without purchase of software.)

MARSHMEDIA INC.
P.O. Box 8082
Shawnee Mission, KS 66208
(800) 821-3303

For each of its products, there is a teacher's guide that correlates the curriculum/skills areas covered by the software package with generic curriculum objectives. The manual also provides general information on integrating the software into the curriculum.

MCE, INC.
157 S. Kalamazoo Mall, Suite 250
Kalamazoo, MI 49007
(800) 421-4157, (616) 345-8681

Eaich of its software manuals contains a listing of the curriculum objectives covered by the software package; these manuals also offer suggusted strategies for integrating MCE software into the curriculum. (Available only with purchase of software.)

REALTIME LEARNING SYSTEMS
2700 Connecticut Ave, NW
Washington, DC 20008-5330
(202) 483-1510

Offers the "Teachers Guide to Using Computer Networks for Written Interaction;" this is a comprehensive guidebook that provides varied strategies, activities, and lesson plans for using Realtime's writing software across the curriculum and to complement a variety of non-computer-based instructional activities.

SCHOLASTIC
P.O. BOX 7502
2931 East McCarty St.
Jefferson City, MO 65102
(800) 541-5513
(800) 392-2179 in MO

Most of its software comes with a teacher's guide that correlates the curriculum/skills areas covered by the software package with generic curriculum objectives. Also offers a detailed teacher's guide describing how each of its sofware products can be used to complement non-computer-based instruction. (Available only with puchase of software.)

SOCIATY FOR VISUAL EDUCATION, INC.
1345 Diversey Parkway
Chicago, IL 60614
(312) 525-1500 or (800) 621-1900

Offers a brief teacher's guide containing helpful hints for using its software to prepare for or follow-up typical classroom instructional activities. (Available only with puchase of software.)

SOUTHWEST EDPSYCH SERVICES, INC.
2001 West Silvergate Drive
Chandler, AZ 85004
(602) 253-6528

Each of its software manuals contains a complete listing of the curriculum objectives covered by the software package. Also offers a detailed techer's guide describing how each its software products can be used to complement non-computer-based instruction. (Available only with purchase of software.)

SUNBURST COMMUNICATIONS
101 Castleton Street
Pleasantville, NY 10570
(800) 628-8897
(800) 247-6756 in Canada

Offers the "Sunburst Curriculum Planner," a comprehensive guidebook that provides varied strategies, activities, and lesson plans for using Sunburst software across the curriculum, and to complement a variety of non-computer-based instructional activities. (Free with purchase of software.) Also provides teacher training.

TEACH YOURSELF BY COMPUTER INC.
349 W. Commercial Street
Suite 1000
E. Rochester, NY 14445
(716) 381-5450

Offers a brief teacher's guide containing helpful hints for using its software to prepare for or follow-up typical classroom instructional activities. (Available only with purchase of software.)

6. SOURCES OF PUBLIC DOMAIN

Why would I want public domain software?

It is free and sometimes very good.
If you don't have a big budget, you can start your software collection with the basics.
It is readily available and can be downloaded from electronic bulletin boards.

Sources of PD Software for Apple Computers...

ADVANTAGE COMPUTING
24285 Sunnymead Blvd.
Suite 212
Moreno valley, CA 92388
(800) 356-4666; (714) 924-5889 in CA

DYNACOMP INC.
Dynacomp Office Bldg.
178 Phillips Road
Webster, NY 14580
(800) 828-6772; (716) 265-4040 in NY

PUBLIC DOMAIN EXCHANGE
2074-C Walsh Avenue, #770
Santa Clara, CA 95054
(800) 331-8125; (408) 496-0624

PUBLIC DOMAIN LIBRARY OF THE DUNCAN INSTITUTE
Box 138CS
18 Duncan Drive
New Port Richey, FL 33552
(813) 848-0413

SOFTWARE OF THE MONTH CLUB
511-104 Encinitas Blvd.
Encinitas, CA 92024
(619) 931-8111

PUBLIC DOMAIN SOFTWARE ON FILE
Facts on File
460 Park Avenue South
New York, NY 10016
(800) 322-8755

This library company publishes PUBLIC DOMAIN SOFTWARE ON FILE, a collection of over 200 programs for the Apple II series (20 disks) that have been de-bugged and selected based upon critical evaluations. Includes a librarian's guide, users guide, bulletin board poster to advertise the service, and a sample press release. Cost is $195.

Sources of PD Software for IBM and Compatible Computers...

ALL MICRO SOFTWARE
P.O. Box 1175
Cardiff, CA 92007
(619) 931-2520

BEST BITS AND BYTES
P.O. Box 8245
Van Nuys, CA 9140
(800) 245-BYTE; (818) 764-9503 in CA

BOSTON COMPUTER SOCIETY
One Kendall Square
Cambridge, MA 02139
(617) 252-0600
($35 membership fee)

MICRO STAR
1105 Second Street
Encinitas, CA 90024
(800) 444-1343

NATIONAL SOFTWARE LABS
3767 Overland Ave., #112
Los Angeles, CA 90034
(213) 559-5456

PC-SIG
1030-D East Duane Ave.
Sunnyvale, CA 94086
(408) 730-9291

PEOPLE'S CHOICE
P.O. Box 171134-P
Memphis, TN 38187
(800) 999-0471; (901) 763-0471 in TN

PUBLIC DOMAIN EXCHANGE
2074-C Walsh Ave., #770
Santa Clara, CA 95050
(800) 331-8125; (408) 496-0624 in CA

PUBLIC SOFTWARE LIBRARY
P.O. Box 37705-PG
Houston, TX 77235-5705
(713) 721-5205
(713) 721-6104

REASONABLE SOLUTIONS
2101 West Main Street
Medford, OR 97501
(800) 876-3475

SHARE-NET
P.O. Box 12368 Dept. G
Oklahoma City, OK 73157
(405) 524-5233

SOFTWARE EXCITEMENT
P.O. Box 3072
Central Point, OR 97502
(800) 444-5457

7. ON-LINE INFORMATION SERVICES

Why should I use on-line information services?

On-line information services let you send information from one computer to another using the telephone. These services include conferencing, bulletin board, and electronic mail.

CONFERENCING- This form of telecommunication allows you to hold a meeting or conference, without all the conferees being present in the same geographic location.

BULLETIN BOARDS- These messages can be saved in memory and printed for permanent records. This computer service allows users to access a central "host" computer to read and post electronic messages.

ELECTRONIC MAIL-The computer stores messages, directs them to their intended recipients and reproduces the text or graphics for the appropriate receiver. Electronic mail allows for two-way messages.

CompuServe Information Service
5000 Arlington Center Blvd..
P.O. Box 20212
Columbus, OH 43220
(800) 849-8199

CompuServe allows access to on-line wire services and news, including databases that provide educational information. It also provides electronic mail, personal computing services, and family-oriented information.

Dialog Information Services, Inc.
3640 Hillview Avenue
Palo Alto, CA 94304
(415) 858-2700

Dialog is an on-line data retrieval system that allows the user to access a variety of databases by telephone. It has been used for years by libraries but is now available to personal computer users. Databases such as ERIC and INSPEC (physics, computers, and electronics), as well as the *Exceptional Child Educational Resources*, are available.

Educational Resources Information Center (ECER, ERIC)
Council for Exceptional Children
1920 Association Drive
Reston, VA 22091
(703) 620-3660

ECER is the ERIC database, which has educational materials, reports, bibliographic information, available via computer, microfiche, or paper copy.

KIDSNET
6856 Eastern Ave., NW
Suite 208
Washington, DC 20012
(202) 291-1400

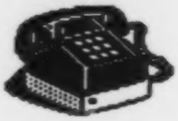
This is a computerized clearing house, maintaining databases of more than 25,000 programs appearing on network, cable, or public broadcasting stations. Subscribers receive detailed program information, including grade level, objectives, awards received, and the availability of teacher or parent guides.

Linc, Resources, Inc.
4820 Indianola Ave.
Columbus, OH 43214
(614) 885-5599

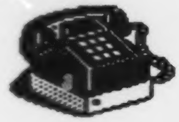
This is a computerized database of somtware for instruction, personal assistance, administration, and testing. They offer free searches.

Tell'em Ware Database
Tell'em Ware
1714 Olso Way
Marshalltown, IA 50158
(515) 752-9667

This is an Appleworks database of organizations, companies, and individuals offering assistance, information, or products to assist school-age special needs computer users. Offers Apple, IBM, and Generic application information.



8. NETWORKING



Why would I want to know about networking?

Networks allow teachers and administrators to offer students a large selection of software applications without handling floppy disks.

They also let you share printers, control the software programs students use, and connect , classroom systems with computers in the lab or office.

Networks also allow inter-communication between various operating systems, such as Apple and IBM, greatly expanding the commincation capabilities within a school or a school district.

What is Local Area Networking (LAN)?

LAN is a series of microcomputers and printers linked together, usually in the same building. They are connected by adapters, cables, and network software, which let all computers share information.

What are some of the available LANs?

APPLETALK NETWORK SYSTEM
Apple Computer, Inc.
20525 Mariana Ave.
Cupertino, CA 95014
(408) 996-1010
TLX 171-576

In an AppleTalk network protocol, you may see up to 32 Apple IIes, Apple IIGSs, Macintosh Pluses, Macintosh SEs, Macintosh IIs, and MS-Dos computers, and peripherals such as printers linked together. Multiple networks can be connected with bridges, to create a large inter-network.

Aristotle is a two-part applications designed specifically for educators. It includes a menu-management program that allows teachers or network administrators to individualize the students' options of software applications.

COMPULYNX Server III
Software and Printing Network
9236 Deering Ave.
Chatsworth, CA 91311
(818) 407-1985

With this network system, a hard disk server is used with the Apple II family workstation options.

DIGICARD D-NET
Major Educational Resources
10153 York Road Suite 107
Hunt Valley, MD 21030
(301) 628-1527

In this system, the file server is on hard disk, and utilizes Macintosh, Apple II family and MS-DOS computers as workstations.

VNET
Velan, Inc.
849 Independence Ave.
Mountain View, CA 94043
(415) 949-9150

VNET uses AT compatible or Tandy 4000 with a 20MB to 115MB internal hard drive as file servers, and any combinations of Apple II, Macintosh, IBM PS/2 and compatibles, IBM PC jr., and Tandy computers as workstations.

What is Wide Area Networking (WAN)?

WAN performs on a wider scale with the ability to link several buildings or entire school districts.

What WAN products are available?

Crosstalk XVI 3.72
DCA/Crosstalk Communications
1000 Alderman Drive
Alpharetta, GA 30076
(404) 442-4930

This is a totally menu driven communication package.

ProComm Plus 1.1b
Datastorm Technologies, Inc.
3212 Lemonne Blvd.
P.O. Box 1471
Columbia, MO 65201
(314) 474-8461

This is a flexible and fairly powerful communication package.

9. USERS’ GROUPS

Why should I join a users’ group?

Users’ groups are non-profit organizations, which are formed based on brand of computer being used, subjects being taught, or other special interests.

These groups often arrange for members to share or trade hardware and software, as well as experience and advice.

As a member, you will have the opportunity to access electronic bulletins free of charge. Some groups are also large enough to obtain group discounts when purchasing equipment or supplies.

How to find users’ groups and clubs?

Ask your local computer dealer for the name of a user group near you.

Apple Users Groups

Toll free Apple users’ groups number
1-(800)-538-9696

Berkeley Macintosh User Group
1442-A Walnuyt Street #62
Berkeley, California 94709
(415) 849-9114

This group provides a newsletter and CD-Rom full of public domain software. They also provide disk index of public domain software.

The Boston Computer Society Mac User Group
48 Grove St.
Somerville, MA 02144
(617) 625-7080

This group publishes a directory for its collection of new public domain or shareware utilities.
Membership: $25.00/year

IBM Users Groups

IBM Educator’s Users’ Group
Charles County Board of Education
P.O. Box D
Radio Station Road
LaPlata, MD 20646
(301) 932-6610

This group shares a database of members that exchange information, software, ideas, and provide speakers at meetings.

Learn Inc.
National Headquarters
Box 752
Georgia State University
Atlanta, GA 30303-3083

This is an IBM User Group of educational systems hardware and software products. The services and benefits of Learn membership include newsletters, and annual meeting of members to exchange information and provide hands-on experiences, and more as time goes on.

10. RESOURCE CENTERS

Why would I want to find out about Computer Resource Centers?

Resource centers provide materials and information relating to computer technology in education, as well as adaptive and assistive devices.
Most centers have hardware, software, and peripherals available for preview and/or loan.
Utilization of the resource centers in your area will be very helpful to educators, as well as parents.

Center for Social Organization of Schools
Johns Hopkins University
3505 N. Charles Street
Baltimore, MD 21218
(410) 516-0370

This center conducts research and disseminates information on the use and effectiveness of computers for instruction and learning in schools.

Center for Study of Educational Technology
MECC/University of Minnesota
Office of the Dean, Burton Hall
Minneapolis, MN 55455
(612) 569-1500

This partnership between a higher education and a private corporation provides original research into the design and effects of technology in education. Periodic reports on current research activity are available.

Center for Special Education Technology (CEC)
1920 Association Drive
Reston, VA 22091
(800) 873-8255

This federally funded project of the Council for Exceptional Children monitors new and existing technology appropriate for special education. This national information about special educaton and technology to service providers, educators, researchers and publishers.

Center for Technology and Human Diabilities
2301 Argonne Drive
Baltimore, MD 21218
(410) 554-3113/3046

The partnership between The Johns Hopkins University and the Maryland State Department of Education focuses on direct service, applied research, and training and education. The Center's library/demonstration center offers viewing of computers, alternate input devices, videotapes, and copying public domain software.

COMPUPLAY Centers

These are computer family play and resource centers located in many cities across the United States. The centers offer computer play facilities. To find out about a COMUPLAY Center in your area, contact:

Mary Trieschman
Lekotek Center
2100 Ridge Avenue
Evanston, IL 60204

(708) 328-0001

Delaware Learning Resource System/Center for Technology
Education Resource Center
012 Willard Hall Education Building
University of Delaware
Newark, Delaware 19716
(302) 451-2084/2335

This center is committed to new technologies in the area of special education with the major emphasis on computers and assistive devices. The center provides hardware, software, and peripheral devices for preview and loan, as well as in-service training.

Eastern Instructional Support Center
200 Anderson road
King of Prussia, PA 19406
(215) 265-7321

This resource center offers a computer preview lab, and its focus is the application of technology in the classroom. Equipment and assistive devices are available for loan.

Education Technology Center
Harvard University
337 Gutman Library
Cambridge, MA 01238
(617) 495-9373

ETC is a federally funded center designed to find ways of using educational technology to teach science, math, and computing. The center will design software and instructional materials to help students understand some of the most frequently misunderstood relationships in math and science. ETC Targets, a free quarterly newsletter available upon request, announces new publications and describes current activities.

EducationTechnology Center
University of California
Irvine, CA 92717
(714) 856-6665

The Educational Technology Center conducts several projects related to the development of computer-based instruction at all levels.

Education Testing Service (ETS)
Computer Education Programs
Rosedale Road
Princeton, NJ 08541
(609) 921-9000

ETS acts as an educational training center for teacher and administrators. Housing over 3,500 educational software programs, this program focuses on instructional and administrative applications of computers. ETS also acts as a clearinghouse for educational software.

World Wide Disability Solutions
Apple Computer, Inc.
Office of Special Education/NSEA
20525 Mariana Ave., M/S 36-M
Cupertino, CA 95014
(800) 776-2333

This alliance links 11 established local and regional centers that provide resources and information about computers and other technology to aid people with disabilities. Each member center conducts training workshops and product fairs.

Project Seraphim
1101 University Ave
Madison, WI 53706
(608) 263-2837

This project focuses on software for chemistry education through the postsencondary level. It distributes over 600 software programs developed by chemistry teachers, provides training through a national network of science teachers, and supports new software development. A new publication, *Journal of Chemical Education: Software*, provides high quality, peer-reviewed software on floppy disk with written support materials.

Technical Education Research Center (TERC)
1696 Massachusetts Ave
Cambridge, MA 01238
(617) 547-0430

The computer Resource Center of TERC houses information on software and hardware. Visitors to the center can try various microcomputer products and inspect educational software. The center provides workshops on programming the application of computers in instruction. TERC publises a newsletter on educational compution titled, *Hands On*.

11. NATIONAL PROJECTS

Why should you stay informed about national projects or organizations in technology?

You can stay current on the latest technological innovations and applications, and keep abreast of the latest research findings applicable to classroom practice.

The National Special Education Alliance

The National Special Education Alliance (NSEA) is a growing coalition of community-based resource centers, professional organizations, and technology vendors working together to increase the impact of promising new computer technology on the lives of people with disabilities. The goal of the Alliance is to increase awareness, understanding, and most importantly, the implementation of microcomputer technology to aid individuals with disabilities.

This grassroots orientation of the NSEA is one of the underlying themes of the Alliance and represents one of its major strenghts. Acceptance in the Alliance requires that each resource center be a genuinely collaborative venture among people with disabilities, their parents and friends, and professionals in the fields that serve them (education, rehabilitation, and so forth).

PARTICIPATING NSEA SITES:

CALIFORNIA

Disabled Children's Computer Group
2029 Rose Street
Berkeley, CA 94709
Contact: Kate Sefton
(415) 841-3224

Special Awareness Computer Center
Rehabilitation Center
2975 North Sycamore Drive
Simi Valley, CA 93065
Contact: Suzanne Feit
(805) 582-1881

Special Technology Center
c/o UCPA
100 View Street, Suite 108
Mountain View, CA 94041
Contact: Lisa Cohn
(415) 961-6789

Team of Advocates for Special Kids
100 West Cerritos
Anahiem, CA 92805
(714) 533-8275

COLORADO

Access Ability Resource Center
1056 East 19th Ave.
Denver, CO 80218-1088
Contact: Ann Grady
(303) 861-6250

FLORIDA

Computer C.I.T.E.
Valencia Community College
215 East New Hampshire
Orlando, FL 32804
Contact: Carol Cohen
(407) 898-2483

ILLINOIS

Technical Aids & Assistance for the Disabled Center
1950 West Roosevelt
Chicago, IL 60608
Contact: Margaret Pfrommer
(312) 421-3373

IOWA

R.E.A.D.I.
318 Fifth Street SE
Cedar Rapids, IA 52401
Contact: Tom Meeker
(319) 365-2683

KANSAS

Technology Resources for Special People
3023 Canterbury
Salina, KS 67401
Contact: Marjorie Hargis-Delker
(913) 827-0301

KENTUCKY

Disabled Citizens Computer Center
Louisville Free Public Library
4th and York Streets
Louisville, KY 40203
Contact: Bob Glass
(502) 561-8637

SpeciaLink
36 West 5th Street
Covington, KY 401011
Contact: Walter and Elaine Hackett
(606) 491-2464

MICHIGAN

Living and Learning Resource Center
Physically Impaired Association of Michigan
601 West Maple Street
Lansing, MI 48906
Contact: Donna Heiner
(517) 487-0883
(800) 833-1996 (Michigan)

MINNESOTA

Pacer Center, Inc.
4826 Chicago Ave. South
Minneapolis, MN 54187-1055
Contact: Daniel Berks
(612) 827-2966

MISSOURI

Computer Resource Center
St. Louis Easter Seal Society
5025 North Rup Ave.
St. Louis, MO 63110
Contact: Nancy Lacey
(314) 776-1996

MONTANA

Parents, Let Us Unite for Kids
1500 North 30th Street
Billings, MT 59101-0298
Contact: Katharin Kelker
(406) 657-2055

NEVADA

Nevada Technology Center
2880 East Flamingo
Las Vegas, NV 89121
Contact: Bruce McAnnay
(702) 735-2922

NEW YORK

Techspress Resource Center for Independent Living
401 Columbia Street
Utica, NY 13502
Contact: Russ Holland
(315) 797-4642

OHIO

Technology Resource Center
3201 Marshall Road
Dayton, OH 45429
Contact: Pat Cashdollar
(513) 294-8086

TENNESSEE

West Tennessee Special Technology Resource Center for the Disabled
227 McCowat
P.O. Box 3685
Jackson, TN 38303
Contact: Margaret Doumitt
(901) 424-9089

East Tennessee Special Technology Access Center
Dept. of Special Services Education
5719 Kingston Pike
Knoxville, TN 37919
Contact: Lois Symington
(615) 584-4465

National Organizations of Educators, Special Educators, Rehab Professionals, and Parents

Agency for Instructional Technology
P.O. Box A
Bloomington, IN 47402
(812) 339-2203

This non-profit organization produces and distributes instructional materials related to technology.

Association for Educational Communications & Technology
2025 Vermont Ave. NW
Suite 820
Washington,DC 20005
(202)347-7834

AECT promotes effective uses of media and technology in education, and works to increase understanding of educational computing.

Eductech
JWK International Corporation
7617 Little River Turnpike
Annandale, Virginia 22003
(703) 750-0500
This agency encourages interaction and cooperation between technologists and educators about meeting the needs of special education. It provides information on an electronic bulletin board on SpecialNet.

International Society for Technology in Education
1787 Agate Street
University of Oregon
Eugene, OR 97403
(503) 346-4414

This organization serves the K-12 educational market, with the goal of improving instruction through technology. It publishes several journals, books and courseware. (See Assoc. & Journals)

LINC Resources, Inc.
4820 Indianola Ave.
Columbus, Ohio 43214
(614) 885-5599

Non-profit organization dealing with education and technology. Offers LINCNotes Newsletter, (See Magazines and Newsletters) and electronic bulletin boards on SpecialNet and CompuServe (See On-line information)

National Association of State Directors of Special Education (NASDE)
1800 Diagonal Road
Suite 220
Alexandria, VA 22314
(202) 296-1800

Contact your local state director's office, or the national office for assisstance in locating appropriate federal, state, and local resources and agencies.

The National Easter Seal Society
70 East Lake Street
Chicago, Illinois 60601
(312) 726-6200

This organizatin works to support rehabilitaton research, technology applications research, and educational and recreational programs for people with disabilities.

National Organizations on Educational Computing

Associaton for Computing Machinery (ACM)
11 West 42nd Street, 3rd Floor
New York, NY 10036
(212) 869-7440

ACM is dedicated to the promotion of free interchange of information about the sciences and arts of information processing. ACM is made up of special interest groups in computers and society, personal computing, computer science educaton, computer use in education, and the ACM Elementary and Secondary School Subcommittee.

Association for Educational Communications and Technology (AECT)
2025 Vermont Ave.
Suite 820
Washington, DC 20005
(202) 347-7834

AECT promotes effective uses of media and technology in education and works to increase understanding of educational computing.

International council for Computers in Education (ICCE)
University of Oregon
1787 Agate Street
Eugene, OR 97403
(503) 346-6614

ICCE is a professional organization for people interested in instructional computing at the precollege level. There are 42 regional organizations. ICCE publishes a series of instructional computing booklets.

National Council of Teachers of Mathematics (NCTM)
1906 Association Drive
Reston, VA 22091
(703) 620-9840

NCTM is a professional organization whose purpose includes promoting the use of computers in mathematics education. It has developed software evaluation guides and provides seminars and conferences on the development and use of computer based mathematics curriculum

12. FUNDING SOURCES AND GRANTS

Why should I know about funding sources and grants?

If you don't have the budget to purchase equipment, or would like to supplement your purchasing capabilities, you can contact these sources for assisstance.

Where should I start looking for funding sources and grants?

There are many possibilities:

1) Local Fund Raising
2) State and Federal Fund Raising
3) Private Founations
4) Publications

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1. Local Fund Raising

Fund raising drives for puchasing computers for your school can be bery successful.

If you wish professional help with a local fund raising effort, contact:

America's Favorite Fund
Raising Products Co.
8404 Sterling
Kansas City, MO 64138
(800) 821-8466

This company offers a school fund raising program involving the sale of candy bars.

Campbell Soup Comany-Labels for Education Program
Campbells' Labels for Education Program
406 East 7th Street
Monticello, MN 55365
(612) 295-5570

This is a community-school based collection drive, which can deliver free equipment to schools in exchange for labels from the company's products.

The merchandise catalog offers many educational aids, with a large selection of computer hardware and software.

To find out more about this program send for a catalog.

NASCO Inc.
27 North Main Street
Springfield, TN 37172
(615) 384-0100

This company offers a brochure-type fundraising program for schools.

2. State and Federal Funding

As you are probably aware, government funding has changed a great deal over the last several years. At present, Chapter I Basic Grants and Chapter II Block Grants are reliable funding sources.

To assist you in finding out what funds your state is releasing under these two federal programs, here is a brief summary of each program, and a listing of the coordinators for each state.

CHAPTER II

The major program of Chapter II funding is the improvement of basic skills (reading, math, etc.), although these funds are also being used to purchase computer equipment for school libraries, gifted and talented, and computer literacy programs.

CHAPTER II COORDINATORS

ALABAMA

Dr. Elouse Kirk
Chapter 2 Coordinator
Gordon Persons Building
50 North Ripley Street, Room 5336
Montgomery, Alabama 36130
Telephone: (205) 242-3901
FAX Number: (205) 242-7908

ALASKA

Dr. William Buell
State Chapter 2 Cooridinator
State Department of Education
State Office Building
P.O. Box F
Juneau, Alaska 99811
Telephone: (907) 465-2824
FAX Number: (907) 463-5279

ARIZONA

Mr. John Hickinbotham
Chapter 2 Coordinator
State Department of Education
1535 West Jefferson Street
Phoenix, Arizona 85007
Telephone: (602) 542-2147
FAX Number: (602) 542-5283

ARKANSAS

Ms. Glenda Peyton
Chapter 2 Coordinator
State Department of Education
#4 Capitol Mall
Little Rock, Arkansas 72201
Telephone: (501) 682-4276
FAX Number: (501) 682-1146

CALIFORNIA

Dr. Fred Tempes
Assistant Superintendent
Instructional Support Services
State Department of Education
P.O. Box 944272
Sacramento, California 49244-2720
Telephone: (916) 322-3068
FAX Number: (916) 322-7645

COLORADO

Dr. Arvin C. Blome
Associate Commissioner
Chapter 2 Coordinator
State Department of Education
201 East Colfax Avenue
Denver, Colorado 80203
Telephone: (303) 866-6783
FAX Number: (303) 830-0793

CONNECTICUT

Dr. Joan Shoemaker
State Chapter 2 Coordinator
Division of Education Support Services
State Department of Education
25 Industrial Park Road
Middletown, Connecticut 06457
Telephone: (203) 638-4205
FAX Number: (203) 638-4218

DELAWARE

Dr. Edwin Skinner
Chapter 2 State Supervisor State Department of Public Instruction
P.O. Box 1402
Dover, Delaware 19903
Telephone: (302) 739-4667
FAX Number: (302) 739-3092

WASHINGTON, DC

Dr. Bonnie Smith
Program Management Officer
District of Columbia Public Schools
415 12th Street, NW
Room 1004
Washington, DC 20004
Telephone: (202) 724-4235
FAX Number: (202) 727-4125

FLORIDA

Mr. Wayne Largent
Chapter 2 Administrator
State Department of Education
Tallahassee, Florida 32399
Telephone: (904) 488-6547
FAX Number: (904) 487-7998

GEORGIA

Dr. Ellinor White
Cooridinator, Chapter 2
State Department of Education
156 Trinity Avenue, SW
Room 210
Atlanta Georgia 30303-3600
Telephone: (404) 656-2444
FAX Number: (404) 651-9447

HAWAII

Dr. Elaine Takenaka
Administrator
Planning & Evaluation Branch
State Department of Education
3430 Leahi Avenue, Building E
Honolulu, Hawaii 96815
Telephone: (808) 735-9024
FAX Number: (808) 732-1943

IDAHO

Mr. Michael Murphy
Coordinator, Chapter 2
State Department of Education
Len B. Jordan Building
Boise, Idaho 83720-3650
Telephone: (208) 334-2186
FAX Number: (208) 334-2228

ILLINOIS

Dr. James H. Mendenhall
Manager, Program Support Section
Illinois State Board of Education
100 North First Street, N-253
Springfield, Illinois 62777
Telephone: (217) 782-3810
FAX Number: (217) 524-4928

INDIANA

Mrs. Phyllis Land Usher
Senior Officer for School Improvement and Performance
Indiana Department of Education
State House, Room 229
Indianapolis, Indiana 46204
Telephone: (317) 232-9127
FAX Number: (317) 232-9121

IOWA

Dr. Oliver Himley
Bureau of Federal School Improvements
Iowa Department of Education
Grimes State Office Building
Des Moines, Iowa 50319
Telephone: (515) 281-3999
FAX Number: (515) 242-6025

KANSAS

Mr. Ken Gentry
Coordinator
State and Federal Programs
State Department of Education
120 East Tenth Street
Topeka, Kansas 66612
Telephone: (913) 296-3161
FAX Number: (913) 296-7933

KENTUCKY

Mrs. Diane Teasley
Division of Support Services
State Department of Education
1719 Capitol Plaza Tower
Frankfort, Kentucky 40601
Telephone: (502) 564-6720
FAX Number: (502) 564-6952

LOUISIANA

Dr. Dan Lewis
Director, Consolidated Programs
State Department of Education
P.O. Box 94064
Baton Rouge, Louisiana 70804
Telephone: (504) 342-3375
FAX Number: (504) 342-3448

MAINE

Mr. Richard K. Riley
Director, Chapter 2
State Department of Education
#23 Education Building
Augusta, Maine 04333-0023
Telephone: (207) 289-5815
FAX Number: (207) 289-5900

MARYLAND

Mrs. Mary Keath
Chapter 2 coordinator
State Department of Education
200 West Baltimore Street
Baltimore, Maryland 21201-2592
Telephone: (301) 333-2294
FAX Number: (301) 333-2226

MASSACHUSETTS

Dr. Elizabeth Toomy
Associate Commissioner
Division of School Programs
1385 Hancock Street
Quincy, Massachusetts 02169
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Appendix E

Set 4 - Leadership Module and Principal's Assistant

SET-4

SCHOOL
LEADERSHIP
MODULE

School Leadership

Strategic Plan
Tactical Plan &
Implementation

INTRODUCTION: As the trend moves to school-based management and increased accountability, the role of the school leader will change dramatically in the 1990's. In order to succeed principals and teachers, in partnership with parents and community members, must use available technology to deliver instructional programs and manage their schools in a more effective and efficient manner.

The purpose of this module is to outline the decisions and processes required to develop and implement a successful school-based technology plan. This module offers twelve essential components needed for successful decision making that will lead to decisions that contribute to the organizational health of the school.

The twelve components are divided among three stages: Strategic planning, tactical planning, and implementation. The 12 essentials constitute a framework for decision making that, if followed, leads to improved productivity, effectiveness, and staff morale.

TIME REQUIRED: Three eight hour sessions

TARGET AUDIENCE: School leadership team which includes the principal, regular and special education teachers, parents, community partners, and all other stakeholders committed to settings goals and standards for the school.

PARTICIPANT REQUIREMENTS: Commitment to the use of technology for school improvement.

School Leadership: Strategic Plan

Introduction: This session will begin with an overview of the twelve components of a successful school-based technology plan, followed by an overview of the three essential phases of a Strategic Master Plan.

Outcome: The outcome for the session is a strategic plan for the use of computer technology in the participants' respective schools.

School Leadership **Session 1**

Handout **SL - 1**

SHOW: Transparency 1. *Participant's Survey Form*

REFER TO: Handout 1.

School Leadership **Session 1**

Handout **SL - 2**

SHOW: Transparency 2.

REFER TO: Handout 2.

Twelve Components of a Successful School-Based Technology Plan

1. *Represents a Collaborative effort from a variety of stake holders.*
2. *Supports the school's Mission and Goals.*
3. *Reflects clear Vision and strong Beliefs about technology.*
4. *Integrates into a broader effort.*
5. *Specifies Network Architecture that Ensures Growth in the future.*
6. *Addresses Immediate Needs and Tasks.*
7. *Takes into account Current Resources and the school's Climate regarding change.*
8. *Delineates specific Goals, Performance Standards, and Implementation Strategies.*
9. *Defines procedures for Monitoring implementation and Evaluating effects.*
10. *Assures on-going Leadership and Support to monitor progress and foster change.*
11. *Provides for Professional Development that reflects the "Best Practices" known about Adult Learning.*
12. *Identifies sources and strategies for Funding.*

DISCUSS: Briefly define and describe each component emphasizing the research findings which support its importance.

School Leadership
Session 1

Handouts
SL - 3, 4A, 4B & 5

SHOW: Transparency 3, 4A, 4B, 5.

REFER TO: Handout 3, 4A, 4B, 5.

- ***Your Master Plan***
- ***Master Plan Example (A)***
- ***Master Plan Example (B)***
- ***Your Master Plan***

DISCUSS: Step participants through the three stages of planning (Transparency 3) using examples (Transparency 4A and 4B) and provide blank samples for participants' use (Transparency 5).

School Leadership
Session 1

Handouts
SL - 6 & 7

SHOW: Transparency 6 & 7.

REFER TO: Handout 6 & 7.

- ***Strategic Planning Concepts***
- ***Prompts for Strategic Planning***

DISCUSS: Take each concept one at a time and discuss using examples from participants' experiences (Handout 6). Group participants by school, if working with staff from more than one school, and have them discuss the questions on handout 7 (Transparency 7).

School Leadership
Session 1

Handout
SL - 5

SHOW: Transparency 5, again.

REFER To: Handout 5.

Your Master Plan

DISCUSS: Instruct each group to consolidate the results of their strategic planning discussion into a clear and concise statement defining "What they want to accomplish with technology?"

THIS ENDS SESSION 1

School Leadership: Tactical Plan

Introduction: This session will begin with a review of the twelve components of a successful school-based technology plan.

School Leadership
Session 2

Handout
SL - 2
Session 1

SHOW: Transparency 1.

REFER TO: Handout 2 Session 1.

Twelve Components of a Successful School-Based Technology Plan

Outcome: The outcome for the session is a tactical plan specifying the goals and/or objectives for the use of computer technology in the participants' respective schools.

School Leadership
Session 2

SHOW: Transparency 2.

OBJECTIVES

1) ***to access the participants' needs and priorities for using computer technology to make their schools more productive places for students, staff, and administrators***

2) ***to begin the development of a tactical plan for the use of computer technology in the participants' respective schools***

3) ***to increase awareness of the potential for using computer technology to manage schools and deliver instruction to students in a more effective and efficient manner***

DISCUSS OBJECTIVE 1: Using the Nominal Group Technique, assess the participants' needs and priorities. From this process, identify the top five priorities for the school.

School Leadership **Session 1**

Handout **SL - 5**

SHOW: Transparency 5 from Session 1., again

REFER TO: Handout 5/Sess.1, Your Master Plan.

Your Master Plan

DISCUSS OBJECTIVE 2: Instruct the groups to translate their top five priorities into specific goals and objectives and record on their master plan handout (SL-5). Demonstrate this step by first showing transparency 2, Session 2, **Sample Goal and Objectives**, and then transparency 4B, Session 1, **Strategic Master Plan Example**.

School Leadership **Session 2**

SHOW: Transparency 3.

Sample Goal and Objectives

***Sample Goal:** To implement a student attendance system period by period, by teacher, by subject, by semester and yearly.*

Sample Objectives:

- ***Develop procedural guidelines for implementing hardware and software***
- ***Provide comprehensive staff development and training***
- ***Gain commitment from students, parents, and community***
- ***Develop and implement corrective actions aimed at improving attendance.***

DISCUSS OBJECTIVE 3: To address objective 3, arrange for the groups to visit a local school that has been using computer technology for administrative and instructional purposes for a number of years. In addition, provide participants with materials, presentations, demonstrations and hands-on activities to increase their awareness for the potential of using computer technology to make their schools more effective.

THIS ENDS SESSION 2

School Leadership: Implementation

Outcome: The outcome for the session is a set of action plans to meet the goals and objectives specified for the use of computer technology in the participants' respective schools.

School Leadership
Session 3

Handouts
SL - 1, 1A
1B, 1C, 1D

SHOW: Transparency 1.

Team Action Plan

REFER: Handout 1, 1A, 1B, 1C, 1D.

Handout 1: ***Implementation Team Action Plan***
Goal: ***Objective:***

Handout 1A: ***Goal:*** ***Implement student attendance system period by period, by teacher, by subject, by semester and yearly.***
Objective: ***Develop procedural guidelines for implementing hardware and software to achieve student attendance goal.***

Handout 1B: ***Goal:*** ***Same as 1A.***
Objective: ***Provide comprehensive staff development and training to achieve student attendance goal.***

Handout 1C: ***Goal:*** ***Same as 1A.***
Objective: ***Gain commitment from students, parents, staff and community to achieve attendance goal.***

Handout 1D: ***Goal:*** ***Same as 1A.***
Objective: ***Develop and implement corrective actions to improve attendance.***

DISCUSS: Assist the participants in delineating the tasks and activities required to meet a specific objective. For each task, encourage the participants to identify the person(s) responsible and set a date for completion. Provide participants examples from handouts 1A, 1B, 1C, 1D.

School Leadership
Session 3

Handout
SL - 2

SHOW: Transparency 2.

REFER: Handout 2.

Project Schedule Example

DISCUSS: Show and discuss example.

School Leadership
Session 3

Handout
SL - 3

SHOW: Transparency 3.

REFER: Handout 3.

Project Schedule

DISCUSS: Assist the participants in filling out a project schedule.

Handout
SL - 4

EVALUATION

THIS ENDS SESSION 3 the final session in School Leadership

Have participants fill out Evaluation Form.

Please Complete
Handout # 1
Participant Survey

(if you have not already done so)

Thank You!

Participant Survey

School Leadership

Handout
SL - 1
Session 1

Name:____________________ District:____________________

Address:____________________ Telephone:____________________

School or Office:____________________ Grade Level:____________________

Teaching Location: Regular Classroom ☐ Resource Room ☐

Subjects Taught or Responsible for Supervising:____________________

Please Rate Your Computer Experience: (Circle the number that corresponds to your experience with computers....**1 signifying beginner and 5 expert**.)

1	2	3	4	5
(beginner)		(competent/comfortable)		(expert)

Please Indicate Your Ability to Access Computers and Rate Your Knowledge of Software: (Please Circle the Correct Response to each Question.)

1. How much access do you have to one computer in your classroom?

   100% **50% - 99%** **25% - 49%** **0 - 24%**

2. Do you have access to more than one computer? **YES** **NO**
3. Can you obtain further access by using a computer lab? **YES** **NO**
4. Do you know how to use many published software products? **YES** **NO**
5. Have you used a wide range of published software in your classroom? **YES** **NO**
6. Have you integrated many published software products into your:
   - weekly instructional plan? **YES** **NO**
   - daily lesson plan? **YES** **NO**
7. Have you gone beyond the lesson suggestions in the publishers' guides or magazines to create your own lessons, using or modifying published software products? **YES** **NO**

Twelve Components of a Successful School-Based Technology Plan

School Leadership
T-2

Handout
SL - 2
Session 1

A Successful School-Based Technology Plan

(1) Represents a **Collaborative** effort from a variety of stake holders.

(2) Supports the school's **Mission** and **Goals**.

(3) Reflects clear **Vision** and strong **Beliefs** about technology.

(4) **Integrates** into a broader effort.

(5) Specifies **Network Architecture** that **Ensures Growth** in the future.

(6) Addresses **Immediate Needs** and **Tasks**.

(7) Takes into account **Current Resources** and the school's **Climate** regarding change.

(8) Delineates specific **Goals, Performance Standards**, and **Implementation Strategies**.

(9) Defines procedures for **Monitoring** implementation and **Evaluating** effects.

(10) Assures on-going **Leadership** and **Support** to monitor progress and foster change.

(11) Provides for **Professional Development** that reflects the **"Best Practices"** known about **Adult Learning**.

(12) Identifies sources and strategies for **Funding**.

Handout
SL - 3
Session 1

Your Master Plan

Essentials of planning include three major components:

(1) Strategic Plan

What do you want to accomplish with technology?

(2) Tactical Plan

What are your specific goals and/or objectives?

(3) Implementation Plan

What are the steps required to accomplish your goals?
Who does what and how to accomplish the tactical plans?

Strategic Master Plan Example

School Leadership
T-4A

Handout
SL - 4A
Session 1

Strategic Plan

"What do you want to accomplish with technology?"

To meet the educational needs of ALL members of the community and foster harmonious relationships among the diverse segments of the community using technology.

Tactical Plans

"What are your specific goals and/or objectives?"

To establish a Family Learning Center to provide parents educational opportunities and involve them in the education of their children using an intergenerational approach to education.

To increase student reading and higher order thinking skills through the implementation of process writing skills.

To improve instructional and administrative management capacity at the school.

To strengthen partnerships with community and business organizations to provide an ongoing education and training experience for community members.

Implementation

"What are the steps required to accomplish your goals and/or objectives? Who does what and how to accomplish your tactical plan?

Evaluate/select software/hardware for each grade level and all students (Complete Team Action Form)

Design diagram of school network and delineate staffing (Complete Team Action Form)

Designate funding (Complete Team Action Form)

Prepare for training and on-going support (Complete Team Action)

Prepare school for installation of hardware (Complete Team Action Form)

Strategic Master Plan Example

School Leadership T-4B

Handout SL - 4B Session 1

Strategic Plan	Tactical Plans	Implementation
"What do you want to accomplish with technology?"	*"What are your specific goals and/or objectives?"*	*"What are the steps required to accomplish your goals and/or objectives? Who does what and how to accomplish your tactical plan?*
Implement student attendance system period by period, by teacher, by subject, by semester, and yearly.	Develop procedural guidelines for implementing hardware and software to achieve student attendance goal.	
	Provide comprehensive staff development and training to achieve student attendance goal.	
	Gain commitment from students, parents, staff and community to achieve attendance goal.	
	Develop and implement corrective actions to improve attendance.	

Your Master Plan

School Leadership
T-5

Handout
SL - 5
Session 1

Strategic Plan	Tactical Plans	Implementation
"What do you want to accomplish with technology?"	*"What are your specific goals and/or objectives?"*	*"What are the steps required to accomplish your goals and/or objectives? Who does what and how to accomplish your tactical plan?*

Handout
SL - 6
Session 1

Essential Strategic Concepts

(1) represents a **COLLABORATIVE** effort from a variety of stakeholders

(2) supports the school's **MISSION** and **GOAL**

(3) reflects clear **VISION** and **STRONG** beliefs about technology

(4) **INTEGRATES** into a broader effort

(5) visualizes **NETWORK ARCHITECTURE** that **ENSURES GROWTH** in the future

(6) addresses **IMMEDIATE NEEDS** and **TASKS**

(7) assures on-going **LEADERSHIP** and **SUPPORT** to monitor progress and foster change

(8) provides for **PROFESSIONAL DEVELOPMENT** that reflects the **"BEST PRACTICES"** known about **ADULT LEARNING**

Prompts for Strategic Planning

School
Leadership
T-7

Handout
SL - 7
Session 1

What do you want to accomplish with technology?

1. Who are your stakeholders? What plans do you have to involve these various stakeholders in creating a vision, and setting goals and standards at your school? What organizational vehicles are you considering?

2. What efforts has your school already undertaken to develop a clear vision of its mission, beliefs, and goals? What efforts or documents exist that reflect what the school's graduates should know and be able to do? What efforts are still to come?

3. What efforts has your school already undertaken to construct a usable and sufficiently developed vision and set of beliefs regarding technology? What methods have you used to make models and images of "excellent" uses of technology available to staff? What time have you set aside for staff to reflect and what methods and accessibility to expert input from insiders and outsiders?

4. What broader efforts affect your school? What involvement do representatives from these broader efforts have with your school? What time and methods have you used to make staff aware of these broader efforts?

Twelve Components of a Successful School-Based Technology Plan

1. Represents a **Collaborative** effort from a variety of stake holders.
2. Supports the school's **Mission** and **Goal**.
3. Reflects clear **Vision** and strong **Beliefs**.
4. **Integrates** into a broader effort.
5. Specifies **Network Architecture** that **Ensures Growth** in the future.
6. Addresses **Immediate Needs** and **Tasks**.
7. Takes into account **Current Resources** and the school's **Climate** regarding change.
8. Delineates specific **Goals, Performance Standards,** and **Implementation Strategies**.
9. Defines procedures for **Monitoring** implementation and **Evaluating** effects.
10. Assures on-going **Leadership** and **Support** to monitor progress and foster change.
11. Provides for **Professional Development** that reflects the **"Best Practices"** known about **Adult Learning**.
12. Identifies sources and strategies for **Funding**.

OBJECTIVES

1) to access the participants' needs and priorities for using computer technology to make their schools more productive places for students, staff, and administrators

2) to begin the development of a tactical plan for the use of computer technology in the participants' respective schools

3) to increase awareness of the potential for using computer technology to manage schools and deliver instruction to students in a more effective and efficient manner

Sample Goal and Objectives

Sample Goal: To implement a student attendance system period by period, by teacher, by subject, by semester and yearly.

Sample Objectives:

- Develop procedural guidelines for implementing hardware and software
- Provide comprehensive staff development and training
- Gain commitment from students, parents, and community
- Develop and implement corrective actions aimed at improving attendance

Team Action Plan

School Leadership
T-1

Handout
SL - 1
Session 3

Implementation

Team Action Plan

Goal: ____

____

Objective: ____

____

Tasks/Activities	Person(s) Responsible	Participants Persons Involved	Time Frame

Team Action Plan

School Leadership

Handout
SL - 1A
Session 3

Implementation Action Plan

Goal: Implement student attendance system period by period, by teacher, by subject, by semester and yearly.

Objective: Develop procedural guidelines for implementing hardware and software to achieve student attendance goal.

Tasks/Activities	Person(s) Responsible	Participants Persons Involved	Time Frame
1. Verify hardware/ software needs.	Project Director		April, 1991
2. Determine location of and install computers and lines.	Principal	IBM/Data Networks	April, 1991
3. Coordinate attendance reporting system with District Office.	Principal/Project Personnel	Principal/District Office Personnel	April, 1991
4. Enter student and staff date.	Project Personnel/ Principal	To be hired	April, 1991
5. Print data verification reports.	Project Personnel/ Principal	Attendance aide	April, 1991
6. Verify data on reports.	Principal	Staff, Students, and Parents	April, 1991
7. Enter corrections of data.	Project Personnel		April, 1991
8. Print period by period rosters.	Principal/Attendance Counselor	Attendance Aide	April, 1991
9. Determine appropriate reports and distribution process.	Principal	Administrative Team	April, 1991
10. Disseminate class lists to teachers.	Attendance Aide	Attendance Aide	May, 1991
11. Implement collection process of data from teachers.	Attendance Personnel	Aides, volunteers, and parents	May 1, 1991 and ongoing
12. Implement scanning process by period.	Attendance Personnel	Attendance Personnel	May 1, 1991 and ongoing

Team Action Plan

School Leadership

Handout
SL - 1B
Session 3

Implementation Action Plan

Goal: Implement student attendance system period by period, by teacher, by subject, by semester and yearly.

Objective: Provide comprehensive staff development and training to achieve student attendance goal.

Tasks/Activities	Person(s) Responsible	Participants Persons Involved	Time Frame
1. Identify participants to be trained.	Principal/Assistant Principal		April, 1991
2. Secure funding for training.	Principal	Director of Project	April, 1991
3. Secure trainer(s).	Principal/Data Networks	IBM/Data Networks	April, 1991
4. Determine training site.	Principal/Assistant Principal	IBM/Data Networks/ Local school cluster	April, 1991
5. Gather input from staff.	Assistant Principal	Staff and trainers	April, 1991
6. Develop schedule/ agenda for training staff and parents.	Principal/Assistant Principal and trainers	Staff and Parents	April, 1991
7. Deliver training.	Trainer(s)	Administrators, Staff, and Parents	May, 1991
8. Provide follow-up sessions from training.	Principal/Trainer(s)	Staff	May - September, 1991

Team Action Plan

School
Leadership

Handout
SL - 1C
Session 3

Implementation Action Plan

Goal: Implement student attendance system period by period, by teacher, by subject, by semester and yearly.

Objective: Gain commitment from students, parents, staff and community to achieve attendance goal.

Tasks/Activities	Person(s) Responsible	Participants Persons Involved	Time Frame
1. Sell to Administrative Team	Principal	Assistant Principals, Deans of Students, Department Chairs	April 1 - 15, 1991
2. Sell to teachers and support staff	Principal	Assistant Principals and Support Staff	April 15 - May 31, 1991
3. Establish a School Development Team	Principal	Students, Parents, Community Leaders, Custodian and Cafeteria Personnel	April 15 - 30, 1991
4. Inform Parents and Community in general	Principal	Principal and Selected Staff	May 1 - September, 1991

Team Action Plan

School Leadership

Handout
SL - 1D
Session 3

Implementation Action Plan

Goal: Implement student attendance system period by period, by teacher, by subject, by semester and yearly.

Objective: Develop and implement corrective actions to improve attendance.

Tasks/Activities	Person(s) Responsible	Participants Persons Involved	Time Frame
1. Analyze data to determine needs.	Principal	Selected staff	September, 1991
2. Prioritize needs.	Principal	Selected Staff	September, 1991
3. Develop corrective action plans.	Principal	Depends on corrective action	September, 1991
4. Implement corrective measures.	Principal	Depends on corrective action	October, 1991 - May 1992
5. Evaluate effectiveness of corrective measures.	Principal	Depends of corrective action	Formative - Ongoing Summative - June, 1992

Project Schedule Example

School Leadership
T-2

Handout
SL-2
Session 3

District: ______________________________

School: ______________________________

Start Date: ______________________________
(month/year)

Target completion date: ______________________________
(month/year)

Implementation Project Schedule Example

ACTIVITY	J	F	M	A	May	Ju	Jy	Au	S	O	N	D
1. Prioritize goals										—	—	
2. Identify objectives and stanards										—	—	—
3. Evaluate/select software/hardware	—											—
4. Designate funding		—	—									
5. Order equipment and software				—								
6. Prepare site					—	—						
7. Prepare training site, materials and schedule			—	—	—	—						
8. Install Equipment							—					
9. Staff training								—	—	— Ongoing	—	—
10. Other												

Project Schedule

School
Leadership
T-3

Handout
SL-3
Session 3

District: ____________________

School: ____________________

Start Date: ____________________
(month/year)

Target completion date: ____________________
(month/year)

Implementation Project Schedule

ACTIVITY	J	F	M	A	May	Ju	Jy	Au	S	O	N	D
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												

Workshop Evaluation

School Leadership

Handout
SL - 4
Session 3

Title of Module (Session): ______________________________

Location: ______________________________

Please list ideas presented at this workshop that could be beneficial to you.

____

____

Based on information presented, I plan to: (place a √ by one or more of the following that describe your plans)

________Make the following changes:
________Try the following ideas:
________Add the following components:

____

____

by______________________ I will be able to share the results with my principal and colleagues.
(date)

Do you feel that you need additional information about the topic? Please circle: **YES** **NO**

Please circle the number which best expresses your reaction to each of the following items:

1. The organization of the session was:

Excellent 1 2 3 4 5 **Poor**

2. The objectives of the module were:

Clearly Evident 1 2 3 4 5 **Vague**

3. The ideas and activities presented were:

Interesting 1 2 3 4 5 **Dull**

4. The scope (coverage) of the topic was:

Adequate 1 2 3 4 5 **Inadequate**

5. The presentation was:

Excellent 1 2 3 4 5 **Poor**

6. My attendance at this workshop should prove:

Beneficial 1 2 3 4 5 **No Benefit**

7. Overall, I consider this workshop:

Excellent 1 2 3 4 5 **Poor**